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ABSTRACT

This packet is a collection of 14 leaflets on topics dealing with education in the middle school. The middle school may be otherwise termed junior high school or intermediate school and may encompass various combinations of grades ranging from the fifth to the ninth grade. Leaflets 1 and 2 deal with understanding the special problems of the preadolescent student. Leaflets 3 and 4 deal with the grouping of students and the organization patterns of teachers to increase learning. Leaflet 5 discusses creativity including the creative person, process, product, and environment. Leaflets 6 through 12 discuss reading, creative writing, science, outdoor education, language, mathematics, and social studies in relation to teaching in the middle school. Leaflet 13 defines evaluation and discusses why the middle school should be evaluated, what is evaluated, and how it should be evaluated. Leaflet 14 deals with new concepts of learning; the author suggests that it is important that education help man evaluate, reject, explore, and revise the media in order to create new and more appropriate learning goals. Nine of the 14 leaflets include a bibliography or suggest further readings.
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The Transitional Years

Middle School Portfolio

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In Between

By GORDON F. VARS

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The middle school, like the middle child in a family, sometimes has difficulty establishing its identity role and status. Many different names have been applied to this "in-between" institution: junior high school, middle school, intermediate school, or even "student center." Its student body may consist of grades 7-8-9, 6-7-8, 7-8, 5-6-7-8, or some other combination; indeed, in a nongraded middle school, there may be no specified grade-level structure. The role of this institution as part of the educational system has been debated since its conception more than sixty years ago, and its status—or lack of it—continues to be of grave concern to its friends. In personality the middle school sometimes imitates its "big brother," the senior high school, and sometimes its "kid sister," the elementary school.

Despite this variability, all in-between school units share a few characteristics and responsibilities that should be considered in designing educational programs for this level.

The In-Between Student

Puberty is a major psycho-biological event that occurs for most children between the ages of ten and fourteen, and most middle schools are organized to include youngsters that are either approaching or in the early stages of adolescence. The fact that puberty now occurs at an earlier age than it did in years past is used by some educators to justify including younger children in the middle-school unit. Others use the same evidence to argue for keeping youngsters in an elementary school environment longer to protect them from growing up too fast. Still other experts assert that the phenomenon we call adolescence is more cultural than biological, hence the exact age at which he reaches puberty is much less important in the child's progress toward maturity than the social environment in which he grows up. Curriculum, teaching staff, and the social-emotional climate of a school are far more important in a child's education than the particular ages or grade levels enrolled.

At any rate, intermediate schools deal with youngsters who are being transformed from children into adults, a transition that is made difficult in our society by the absence of clear-cut definitions of the in-betweeners' roles and status. Add to this the rapid physiological and psychological changes that literally remake the child during this period—changes that proceed at different rates for different characteristics and for different children—and the result is a student body of extreme diversity and complexity. For example, there may be greater differences among

pupils *within* a seventh grade than there are *between* an average seventh-grader and an average senior.

Diversity and rapid change are two characteristics of middle-school students that must receive careful consideration, without regard to how the schools are organized.

The In-Between School

Occupying a position between the elementary school and the high school, middle schools are often caught in a crossfire. High school educators, who often appear to be engrossed with subject-matter mastery and preparation of students for college, seem bent on shoving certain secondary school practices further and further down into the elementary grades. These appear as "beefed-up" subject matter in many academic courses, full departmentalization of the curriculum, tracking, units of credit, and multiple electives.

In response, certain elementary school educators, reflecting a more child-centered point of view, decry this academic emphasis and demand consideration of the learner's all-round development. These concerns appear in the middle school as partially self-contained, block-time or core programs, continued instruction in basic skills, limited electives and much attention to pupils' social and emotional growth.

Since the middle school occupies a position between two educational levels characterized by somewhat different philosophies and programs, articulation is a major concern. Students must be helped to make the transition from elementary school to high school at the same time that they are in transition from childhood to adulthood.

An In-Between Curriculum

One key to effective education during the middle school years is guidance. Students need help with the many personal and social problems of growing up, and they confront educational and vocational decisions of far-reaching consequence. In even the best guidance departments counselors are too few and too isolated from day-to-day contact with students to accomplish the whole task for each student. Guidance specialists working closely with teaching teams can get somewhat closer to students, but the numbers problem persists. Homeroom programs may help, but too often these break down because not every teacher has either the desire or the training to serve as a teacher-counselor. Similar limitations apply when all teachers are expected to provide guidance along with their classroom instruction. In a conventional departmentalized program a teacher may have from 125 to 200 students a day, far too many to know each one well enough to offer helpful advice and counsel.

Many middle schools find counseling problems can be minimized by assigning guidance responsibilities to teachers of modified self-contained or block-time classes. In such programs a teacher or an interdisciplinary team has the same group of students for instruction in two or more subject areas and meets them in blocks of time longer than the usual class period. English and social studies are the subjects most frequently combined; math-science classes are not uncommon. A teacher responsible for two of these classes has only 50 to 70 pupils a day and thus is better able to serve as their adviser.

Centering guidance in the block-time teacher has other advantages. Guidance functions are dispersed among a number of teachers, but not everyone is required to participate as in a homeroom guidance program. Block-time teachers know that guidance is part of their job, and they constitute a small cadre of teachers with whom guidance specialists can work intensively to develop needed skills. Such a close working relationship also facilitates the teacher's referral of difficult cases to the specialist.

Guidance is enhanced if the block-time program approximates a core curriculum. In core the major commitment is to help students deal with problems of significance to them, both personal and social problems of which the student may be aware and those of the society in which he lives. Thus guidance and curriculum are fused. A group-guidance unit, such as "Getting Along with Others," may lead to examination of broader human relations issues ranging from civil rights and "black power" to the search for world peace. The teacher-student planning typical of a core class brings learning experiences even closer to the specific problems and needs of students, and many interpersonal problems are resolved through small-group work. Sometimes just discovering that other young people have similar problems lessens a student's anxiety and eases his passage through the in-between years. Opportunities for a conference between student and teacher arise naturally in such a problem-centered, guidance-oriented program.

A block-time or modified self-contained class also provides a natural transition between the typical elementary program in which a child may have the same teacher for nearly all subjects and the completely departmentalized high school program with different teachers for each subject. Teaching effectiveness may be enhanced because block-time teachers are responsible for fewer subject areas than the typical elementary teacher, yet they have more opportunities for correlating content than the usual high school teacher. Whether block-time is best taught by an interdisciplinary team or by a single teacher with background in several fields is an unresolved issue. In any case, more than thirty years of research on block-time and core programs indicate that students' mastery of subject matter and skills under the combined approach usually equals, and often exceeds, their achievement under full departmentalization.

Common learnings of the type suggested for the block-time or core class might best be provided in groups organized along age or grade-level lines. Such organization provides students with a relatively stable home-base group that changes but little from year to year. In addition, if several block-time classes are scheduled at the same time, temporary cross-graded groups can be formed. Such groups might be organized on the basis of: (1) performance-level, for work on a skill such as reading; (2) social-emotional maturity, for group guidance; or (3) interest, for study of a topic or problem.

Similar nongraded approaches are desirable in a number of subjects taught outside the block-time program. For example, students should be able to progress through carefully sequenced programs in mathematics and foreign language without regard to their chronological age or year in school. Science, art and music might be offered in part through nongraded sequences and in part as components of the problem-centered

instruction in a core class. Portions of the physical education, industrial arts, and home economics programs also might be provided in nongraded classes.

Individualized instruction and flexible grouping are needed to care for the great student diversity at the middle school level. Small group and individual projects may be used in any class to provide for individual differences. Since peer interaction is so important for the in-betweeners' development, it probably is best not to overemphasize the kind of individual learning that keeps students isolated in a study carrel for hours at a time.

Summary

A school that would truly serve youngsters during their in-between years must combine the elementary school's concern for the whole child with the secondary school's stress on scholarship and intellectual development. This balance may best be provided through a program that includes a block-time or core class for guidance and problem-centered learning paralleled by more specialized courses, sometimes nongraded in organization, in such fields as mathematics, science, foreign languages, art and music.

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Pre-Adolescent: Misunderstood

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Sandwiched between two more perceptually impressive developmental stages is the terminal cycle of late childhood. This stage of development by its nature is probably the least likely to attract the penetrating interest of adults except those who must either live with or teach him. For the average child in the nine-to-twelve group there comes the maturational closure of important antecedent years of growth and anticipation of what lies ahead. Normally, as there is consolidation in behavior that assumes neo-adult qualities, there is being produced in him a stability and integration that will become the foundation for the ensuing period of youth.

In the framework of psychoanalytic theory this stage is within the "latency" period. The urgency of sexual strivings toward the parent of the opposite sex is greatly diminished. Thus, the average child is now free to invest a vast fund of energy in his own growth and learning, meeting major cultural expectations and adult demands. The disposition to come to grips with reality is salient and thus there is an increase of the adult tendency to overstructure learning events.

In this phase mutual, reciprocated attachments provide strength that heightens autonomy. Through successful social and affective transactions with agemates the child can diminish extravagant romantic claims to the parent. Relinquishing excessive demands and bridging the gap with others establish the firm basis for surmounting the turbulence of ensuing years.

For the child who is not successful, needing to cling to parental support imperils his immediate adjustments and makes him a greater risk in the pubertal cycle of change. His self-made assurance is needed to move successfully into the adolescent world. To become certain of self, to become certain of "what is me" and "not me but others" is a salient feature in the terminal phase of childhood.

The Need for Time

For example, the child's capacity to understand (grasp temporal relations) and function in relation to a time schedule often leads to excessively demanding regulation and ordering of his behavior. Thus, linear time is an American cultural reality, thought of as a vessel to be filled with quality events of adult discretion. However, the child needs more rather than less time to himself (so evident in harried adult life yet overlooked as a child's need). He needs time to "play out" or "dream out" solutions to the problems with which he is grappling. Privacy, undisturbed by intrusions and thrusting of others, is essential to work at unifying perceptions of the physical and social world. Time, too, to be in the company of other children to explore, share, participate in in-

numerable life crises. This play relationship with real people of *his own age* serves to rework unresolved problems, to make and sustain affective ties that are tested in the reality of everyday life experiences.

The Struggle for Self

Some forms of parent- or teacher-pleasing, academic excellence, mask the basic developmental struggle for self. To exclude others, to avoid hard work or to engage in spectacular diversions, thus drawing greater parental and adult attention and support is behavioral or learning deviancy. Many a child, referred on this account, easily establishes a relationship with a guidance counselor, social worker, psychologist or other adult ancillary school personnel yet finds intimacy and comfortable association terrifying, as he either avoids others his own age or intimidates them to maintain social distance.

To take a chance—to venture and seek to make a friend, to be a friend—means giving up a part of self for a share in the other. Only a child secure in himself can take the risk.

In this period the modality of behavior is incessant involvement in gaining knowledge of a world which is increasingly important to him. His energy is invested in sharpening perceptive skills, building knowledge, mastering the essential tools and symbols of his culture, and it is this learning which provides new opportunities for him to become more of himself.

All his abundant energies are directed toward mastering the world of things, people and meanings, and upon this mastery is founded healthy self-esteem.

Thus it is essential that needless barriers (time schedule, space, classroom regulation) not be erected between child and child; peers provide essential yardsticks to measure success or failure, an extrafamilial dimension to criteria for measuring the accomplishments of self-effort and the degree of self-improvement. The uniqueness of the individual is enhanced by the tight interdependencies of the group. Paradoxical as this may seem at first glance, autonomy proceeds out of mutual dependency at this stage.

Growth in Cognitive Capacity

Piaget describes this level of intellectual maturity as the stage of "operational thought." At the later period, nine to twelve, come mental experimentation and the ability to order the world along criteria lines independent of his intuition, personal reference and proximity in experience.

In contrast with the younger child who will put into his "tool kit" cookies, personal treasures near at hand as well as the necessary hammer, saw, etc., in the nine-to-twelve's kit are relevant task-oriented tools only. That is, as he studies parts and understands their relation to each other he is led to understanding the whole.

There is an emergence of complex hierarchal systems of classification in this stage based on conceptualizations of the internal relations of parts to create the inclusive whole (nesting); and the expansion of subclasses of objects linked by logical connective parts (lattices) to form an orderly world. Presumably schooling gives him a major assist in these mental operations.

Thus, in most matters directly concerning him, the child can order life experiences and be aware of their realistic relationship to each other and to himself. This does not mean to imply that anxiety is necessarily less.

Children tend to be only moderately afraid of possible immediate realistic dangers but are strongly afraid of remote, very unlikely or impossible events, e.g., ghosts, wild animal attacks. Often these can be interpreted as symbolic substitutes for feared, more approximate dangers (parental wrath, defeat and humiliation in school and social encounters).

In effect and through his own efforts, his increasing comprehension of multifaceted experiences provides great stability and feelings of assurance. His more accurate and consistent perceptions of the environment strengthen his certainty. His many stable points of reference permit a firm anchor for his interpretations and experiences in numerous learning and social settings.

Moral Code and Values

Appearing too are the value geometries basic to conscience. Conscience reflects cognitive capacity to internalize a sense of morality—a wrongness-goodness continuum applied, however, without regard to behavioral intent or ameliorated by concern for underlying motivation.

In general, the content of conscience reflects the incorporation and organization of adult standards and expectations and at times reverse application of the standard to the parents' behavior. It is largely a practical system consisting of maxims and homilies systematically pieced together without theoretical foundation.

Rules that will regulate the mutual activities of children nine to twelve are explored and developed in great detail. Children's clubs at this age often may have more designated officers with specified and elaborated functions than they have members! And while these club groups last a comparatively short period, the cohesive force is the refinement and expansion of the regulatory rules governing behavior. Social transactions lead to notions of *fairness* and equality. Describing actions and reactions in light of "fairness" is a preoccupation of this age. Equality judgments once hammered out provide the moral outlook when regarding teacher, parent or peer behavior. For a punishment to be fair it must be objectively applied and in only exact proportion to the misbehavior. Blanket punishments of the whole class, for example, for the deviancy of one or a few is indignantly and angrily reacted to. To be "fair" the teacher must know what is going on, move in on time with appropriate enforcement of rules. Disciplinary actions wide of the mark lead away from productive learning involvement to higher deviancy and management problems.

A View of Self

Tranquil self-certainty comes clearer to the child that has his own world as well as an objective one which is common to all. The child operates in both turning away from the common world toward his own quickly and spontaneously and, vice versa, turning toward it. The common shared world is rational and logical, culturally blueprinted; the private world of fantasy contains numerous possibilities of being and is

thus free to design itself. The private person comes into being with the genuine possibility of being oneself and the possibility of being "we" in a group. There is the ability to see that others have "private worlds," for indeed the self and the world are reciprocal concepts at this stage.

In this stage the average child comes to view himself and others as autonomous actors reciprocating respect and adherence. Violation of the code, such as that found in a "white lie" intended to deceive is a denial of respect and consequently is the worst crime of this age. Pledging and swearing to tell the truth are important rituals of obedience, for the necessity for collective obedience is at the center of the system of morality.

There is an Irish folk tale of the rural young man who during a dispute clouts his father with a shovel and flees to town claiming to have killed the old man, thereby becoming something of an audacious hero. When the furious father appears, quite alive, the indignant villagers run the son out of town as a *liar*, ignoring the fact that he perhaps was a murderer first.

Up to this age the child might be regarded as having been confined to a "situational circle" with himself occupying the center. But the nine-to-twelve has a world, the foundation of which family and school provided, the blueprints of which his culture prescribed, but which *he can transcend*.

The years from nine to twelve are most difficult for adults to grasp and there are many features of this age likely to cause adults to err. There is a tendency to overschedule, fill up time, without regard to value and necessity for children. There is the likelihood of using techniques that reflect moral precepts adults use in reciprocal relations with adults. All violations to personal integrity are serious at this age.

Now the outlook of the child is near to our own, but it is also often too easy to confuse our needs with the child's. He is more capable of vastly greater learnings (sock it to him!), highly imitative of adult behavior (social dance schools) because he is interested in judgments we pronounce too much. Preadolescence culminates with a sense of mastery, of healthy esteem for self-feelings of certainty and mutuality. It is the important structure necessary for the child to embark upon the difficult road to adulthood.

Difficulties in This Age Group

In part, difficulties in this period stem from adult organization, regulation, direction of time, situations and conditions for behavior. Because the child reacts rather well to our expectations for him—he is curious to learn, to "objectify" his world—we are strongly disposed to add on in such ways, in such amounts of conformity and regulation that there is an excessive burden of restraint.

The demands made by others are excessive when external arbitrary dictates of home and school do not permit internal impulse to reign and prescribe the suitable activity.

We have not given sufficient credit for the great amount of responsibility children of this age have assumed and yet how often his own parents and teachers lament the "lack of responsibility" at this age! We take him for granted until external coercive demands exceed his ability to adapt and the frustration spreads in all areas of life, disrupting

other abilities and accommodations in normal situations, and when he finally reacts emotionally and behaviorally to excessive demands he is regarded as a problem child or a child with problems.

We fail to realize that when a child of this age "plays" with his friends for two hours that he has been hard at work adapting to very new and unfamiliar demands of others, learning the basis of mutuality and reciprocity in human terms that are the basis of later human adjustments. He works hard for peer acceptance; this striving can create major tensions. It is difficult for a child to get away from the constant demands and expectations of others. If one looks at life honestly one sees that the child's consumption of energy is vast and that his waking hours are completely filled by learning and social experimentation. Our perception of what it means to play distorts our interpretation of the child's behavior. He is not able to sidestep reality.

A tremendous respect is owed the child, for in fact he meets, on the whole better than many of the adults around him, the great social cultural demands placed on him.

A member of society grasps reality only as it is presented to him in its cultural code. The assumption is that the objective world is codified in the language and behavior patterns of the culture and as mastered and accepted is experienced as reality.

Terminal Cycle

The child achieves in this terminal cycle of childhood the symmetry of foundation on which he will build his adolescent life and then his adult life. But this all takes time. Hastening maturation may prolong childhood personality. Inevitably the child must come to terms with himself, establish himself with certainty, preferably in these years rather than be allowed to postpone the confrontation with himself as a human being growing toward adulthood.

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Bases for Grouping Within the Class

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The existing and emerging needs of a rapidly changing American society can be better understood and served as young Americans in intermediate schools find the means for experiencing meaningful and useful self-education. *Only those methods of grouping can be justified that give promise of maximum contribution to the maturing mind and personality of each child.* Unless living and learning during the years in an intermediate school contribute to continuous improving of the content of each "private" curriculum and its application in living and learning with other persons, teaching and grouping have had small productive value for pupils.

Attractive rooms and resourceful learning materials are desirable features of an intermediate school. These facilities are easily seen and evaluated. The educative center of the classroom, however, contains the purposes, understanding and outcomes which have meaning only in the minds of the teacher and the pupil. The professional role of a teacher, therefore, is to design and provide a potentially productive teaching-learning environment. The mental interaction with the overt communication of the teacher and the reference material is personal and private for the learner. Professional competence and time are required for diagnosing the mental processes and outcomes of each pupil in a classroom or group.

Self and the Environment

A philosophy and practice of grouping are productive only when they produce a "self" and "other" interacting environment that motivate and enrich the mental, emotional and social maturing in the "private" self of the pupil. Interpreting and understanding the unique mind and personality of a girl or boy in order to provide an appropriate resourceful living and learning environment is the professional goal of grouping in an intermediate school. Learning of subjects and social living are conditioned basically by the quality of the "self-image" developed by a pupil during the period of the grouping placement.

Flexible grouping is the most productive method for providing a living-learning school environment in that it gives promise of enriching and strengthening the "under-the-skin" maturing of each pupil. Content and processes of learning are profoundly influenced by the pupil's private evaluation of the group in which he has been placed. The practice of teaching a class or group by any one method, or of applying one set of achievement standards, ignores the reality of individual differences. Intermediate school teachers can design a democratic, resourceful environment insuring for each pupil the means and motivation for developing a creative, informed and productive mind and personality.

The Teacher Analyzes

Professional purposes and desired outcomes concerning grouping of children may be improved and may be more potentially productive when teachers, counselors and principals devote time in examining their private and cooperative response to such questions as:

- How does the teacher interpret the bio-psychological-social nature of a child?
- What may be serious consequences of rigid grouping to the "private" mental, emotional and social maturing of a pupil?
- How may grouping affect the "self and other" conceptual or "private" relationship between a pupil and his parents?
- How may a nongraded intermediate school observe grouping procedures that safeguard pupils from the questionable consequences of grade organization, graded curriculum and periodic promotion?
- Why should teachers accept greater professional responsibility for decision-making related to purpose and practice of grouping in a school?

Teachers' individual and cooperative appraisal of responses to such questions may produce promising innovations in curriculum, teaching, evaluating criteria in an intermediate school.

Curriculum and Grouping

Of the three interrelated curriculums in a classroom, two are the *external or resource* curriculums. A teacher's competency in subjects and reference materials and understanding of child development constitute an indispensable resource environment. Subject matter, problems and directions recorded by sentences and pictures in textbooks and other reference material serve as valuable resource environment or curriculum. The most important curriculum, however, contains the ideas, information and understandings developed and applied in the mental or conceptual behaving and maturing by each learner when interacting psychologically with the two external resource curriculums.

When the objectives of teaching and curriculum are concerned mainly with mastery of subjects and finding solutions to assigned problems, the grouping procedures generally followed are: grade groups, ability groups, remedial groups, and departmental grouping. When given a placement in such a group, a pupil may encounter difficulty in escaping from the status and concomitant learnings acquired during the period of placement.

The scope and speed of the two external curriculums merit examination. Meaningful and productive learning requires time to think, experiment, design experiments and formulate meaningful conclusions. Meaningful and productive "self" maturing can improve when proper concern is given by teachers to psychological or conceptual time rather than clock time.

Nongraded Curriculum and Grouping

An increasing number of school systems have inaugurated a nongraded policy and practice as a more promising replacement for the traditional organization, teacher-grade assignment, grade curriculum, and relative pupil placement in a grade. A nongraded intermediate school provides teachers and members of the administrative staff an opportunity and

challenge to design curriculum, teaching assignments, instructional procedure and grouping practice which are understood to increase the potentials of the living-learning environment for each and all pupils.

The Learning Center

The faculty of an intermediate school or, as it is now often referred to, a Learning Center, accepts cooperative responsibility in formulating administrative policy and duties, organizing related curriculum units, determining teaching assignments, deciding pupil placement and structuring evaluation criteria. Such a circular administration system serves as a promising replacement for the old-line-and-staff operation of an intermediate school. One or more periods are arranged each week when all members of the faculty participate in professional discussions related to evaluating and replanning curriculum units, instructional methods and pupil placement.

At the start of the school year pupils are assigned by the faculty to a homeroom, which has a short management period at the start of the school day and short evaluation or check-up session just before the end of the day. Between homeroom sessions pupils attend faculty-planned curriculum units designed and scheduled to facilitate correlation among subjects and other learning activities. Teachers engage in a team-teaching plan that insures maximum participation based on subject competence and teaching interests. Large instructional groups, small teaching groups, and special remedial groups are determined and scheduled in order to insure maximum and meaningful progress of pupils in the several areas of the coordinated curriculum. Exchanges in teaching assignments are determined by cooperative action among members of the professional team. Decisions concerning placement and evaluation of individual pupils are made cooperatively by the teaching team.

Inter-homeroom Committee or Council

The homeroom is an interdependent group in the school community, wherein pupils have learning experiences contributing to personal development as they elect representatives to serve as members of their school councils. School morale becomes more productive as pupils in homerooms and through their council accept the view that they have genuine opportunity to share in the educational affairs and civic responsibility of their school community.

Interest Grouping

Encouragement and time should be provided for small groups or individuals to pursue study and experiments related to topics or problems of mutual interest. Skill in self-directing and evaluating are important outcomes in curriculum units and various forms of creative recreation. To be privileged for membership in such groups is to accept responsibility for planning and pursuing special interest activity. Members of interest groups are to be encouraged to share their achievements with other pupils. Teachers should find ways to provide more free periods for pupils to engage in study under self-planning and evaluating. Growth in self-direction is comparable in productive application as achievements in curriculum subjects.

Pupil Teaching Opportunity

At times rapid achievers may find interest and satisfaction in helping other pupils improve their understanding of a subject as they assist those who may be experiencing difficulty in learning. A pupil motivated to share his abilities and accomplishments will, for example, exchange his knowledge of an operation in elementary mathematics with a pupil who has done well in science, social studies or one of the arts. A teacher's time is well spent in discussing with pupils the values of sharing their achievements with others.

Special Instructional Groups

This method of grouping offers pupils needing special instruction the opportunity to receive diagnostic and corrective help from a teacher. A teacher-invitation approach is more acceptable to pupils than a teacher-assigned placement. Corrective learning results from remedial teaching when pupils desire help from teachers or members of their group. But many pupils, hesitant to make known their learning difficulty, need appropriate motivation to express their need for special assistance and for learning how to improve conceptual processes when striving to learn. Faulty learning skills are more difficult to correct. Other pupils should be cautioned about using improper labels, such as a "slow-group" or "remedial group." Parents professionally qualified may welcome an opportunity to assist teachers as teachers' aides in working with these groups.

Outcome of Grouping Methods

The grouping method determined and observed by teachers in an intermediate school should:

- encourage pupils to find purpose, meaning, and satisfaction in their individual and group learning experiences
- enable each pupil to experience continued development in maturing self
- motivate growth in exercise of initiative, self-education and group-civic responsibility
- foster the understanding and practice of democratic principles in human relations in the home, school and community
- encourage growth in cooperative planning, critical thinking, purposeful sharing and meaningful evaluation
- provide means for improving psychological communication and social relationships of classroom activities and materials to serve individual differences, interests and instructional needs
- facilitate improvement in pupil-parent relationship and between parent and school understanding
- foster the discovery, appraisal and application of moral values essential in character development
- assist the pupil in discovering and maintaining a courageous belief in himself and love for his community and nation.

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Current Organizational Patterns

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While examining patterns of school organization, educators must resist the temptation to accept the dazzling complexity of the labyrinths of organizational patterns as educational *ends* in themselves. These patterns serve only as *means* or passageways to enable educators more efficiently and economically to traverse the route leading to the only end that is appropriate in education—increased learning by each individual in the areas deemed appropriate by school and society.

Unfortunately, it is easy to become so enmeshed in the logical web of organizational schemes that the “psycho” logical reason they came into being—that of increasing learning—is overlooked. Having lost sight of their objectives, zealous reformers tend to redouble their efforts. The schools of the United States bear the scars of these organizational debacles. Small wonder innovations are sometimes resisted by a “this-too-will-pass” attitude.

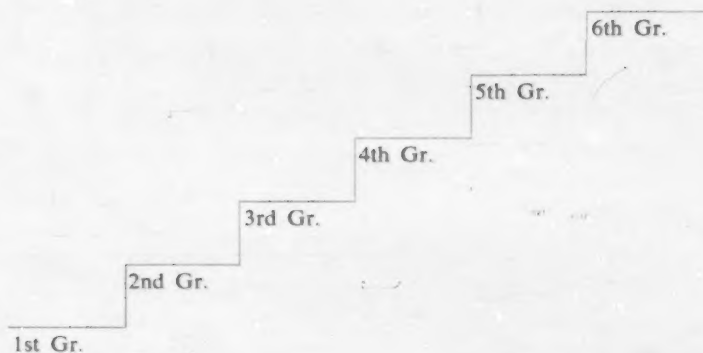
These organizational innovations emerged because the weakness of the traditional patterns of the lock-step graded school was becoming increasingly apparent and research in learning was providing the basis for designing organizational plans that could be more predictably successful.

It is imperative that the criterion, “Will this increase learning?”, become the basis for acceptance or rejection of any organizational plan.

Nongrading and Team Teaching

In the last decade magazines and books have been jammed with accounts of two important innovations in American education: nongrading and team teaching. Not unexpectedly, the arguments for and against these innovations have developed the usual heat without the necessary light. Consequently, it is important that we examine what nongrading and team teaching are and what they are not; what these innovations have been designed to accomplish and what they cannot possibly do.

Nongrading is concerned with a student's progression through the subject matter in school from the time he enters until he is graduated. Nongrading is a way of organizing the school so it is possible for each student to be working at the point in each subject that is just right for him. Nongrading is based on the premise that his learning should be continuous—he should not be repeating that which he already knows and he cannot proceed into more difficult learning with gaps of important unlearned material behind him. Nongrading is a way of custom-tailoring education for each child in order to increase the rate and degree of his learning and to insure that he is always working with the best possible conditions at the precise point where his knowledge leaves off and his learning needs to begin.



Graded School

A graded school is like a series of stair steps. Most students spend a year on each step and then proceed to the next step. This progression usually has no relationship to what they have learned or the appropriate speed of learning at any one time.



Nongraded School

A nongraded school is like an inclined plane where progress is continuous and each student may proceed at a speed that can vary so that it is most appropriate to him.

Rather than being concerned with the learner's progression through school, *team teaching* is designed to maximize the efficiency and effectiveness of teaching so the result will be increased learning as a student progresses. Team teaching is a way of organizing instructional groups or classes in order that each day at school Johnny may accomplish more than if he were assigned to another type of classroom organization.

Schools can be nongraded without team teaching or team-taught without being nongraded. Like apple pie and ice cream, they are two separate things—each good by itself. Together they make a wonderful combination.

Nongrading is *not* assigning students to different classrooms because of their intelligence. Schools with the brightest children in one class and the slowest children in another class are not nongraded schools. Nongrading is *not* a levels system that assigns the good readers to one classroom and the poor readers to a different classroom. Nongrading is *not* moving a student from one room to the next as soon as he has finished a certain amount of work or covered certain material. In a truly nongraded school, a student's placement is *not* primarily determined by how bright he is, what he has already learned or how he scores in any one dimension or on any one test.

Nongrading begins with an educational diagnosis of each student, a diagnosis never considered final but that is constantly being checked, reassessed and, if necessary, altered. Out of this continuing diagnosis grows an educational prescription constantly being tailored to adjust to changes in the learner and the learning situation. This prescription is filled from the pharmacy of educational alternatives provided by the school. A graded school provides few, if any, educational alternatives to fill a prescription. Usually Mr. Jones's class is promoted intact to Mrs. Smith's room. In a nongraded school the number of possible alternatives can be infinite and is limited only by the creativity and competence of the staff. Typically, there are several groups and several teachers to which each student could be assigned. Once assigned to the group, an educational program will be designed to fit the student.

In a graded school it is as if you provided the fifth-grade teacher with a set of ten-year-old clothes. These she placed on the children without any consideration as to whether or not they fit. As a result you would find sleeves too long, belts too tight, shoulders droopy, and general misfit and discomfort, for ten-year-olds come in assorted sizes and shapes and no one size will fit them all.

In contrast, in a nongraded school a teacher would measure her students and order the appropriately sized clothing for each one. As a result you would have well-fitted, comfortable boys and girls. In the same way, schoolwork is fitted to the children so that each child will learn the greatest amount possible. There is no such thing as the "average" child who should have the "typical" program.

For Diagnosis, Three Questions

Needed first is diagnostic information from five areas of a learner's development: mental, physical, emotional, educational and social. Based on this information, the prescription will include the most appropriate teacher for Johnny, the group of boys and girls with whom he will best learn, the type of classroom organization that will propel his learning, and an appropriate educational program within that classroom.

The most important single factor in a student's learning at school is his teacher's ability to promote that learning. Consequently, in a nongraded school the first diagnostic question to be asked is, what style of

teaching is best suited to this particular learner? Should he have a warm, supportive teacher who will encourage him by, "Oh, that's not hard, sit here and I'll help you"? Or is he the kind of a boy who will relax on such a teacher and let her do the work? Does he need a stricter, demanding teacher who says, "I expect that to be finished before you go home tonight."? Or is he the kind of boy who cannot work well under such a threat? Should he have a teacher who usually does things the same way so that he can anticipate what is going to happen? Or does he find this boring and need a great deal of variety in order to remain interested?

The second diagnostic question to be asked in a nongraded school is: in what kind of a group of boys and girls will this particular student learn the most? Should he be top student, bottom, or one in the middle? Will he work better with his friends or be distracted by them? Does he need the security of old friends or the challenge of new? Will the addition or deletion of certain children tend to increase or decrease his learning effort?

Obviously experience in differing positions within the student's family is not possible; however, it is not only possible but highly desirable in a school situation. Those children whose leadership ability quickly propels them to a position of prominence in one class need at some time to have the experience of being with older, more powerful leaders so they can develop the necessary ability to follow. The shy, reluctant child with leadership potential may need to be the oldest, most capable member of a group so that he is encouraged and supported in the development of skills he might be reluctant to try in a more powerful group. Once he has developed these skills, he needs the opportunity to practice them in many different kinds of groups.

Certain pairs of children who cannot get along need to develop immunity to the one who gets them into trouble. This immunization may begin in separate groups, but eventually its success must be tested by putting them together. Conversely, certain children are too dependent upon each other; what one wears, the other wears; what one thinks, the other thinks. Educators and psychologists agree that these children need to become independent. Again, this "weaning process" may be begun when they are in the same group working on different projects and playing on different teams. Becoming an independent individual is not complete, however, until each can function productively in a group which does not contain the other.

The third question in this diagnostic process is, at what level of difficulty in each subject should this student be working? His age and number of years in school will not tell us the answer. Most subjects are sequential in their order of difficulty. You have to be able to count before you can add and subtract and these skills precede multiplication and division. Trying to teach an advanced skill before a student has mastered the preliminary skills is not only a waste of time, it actually interferes with the learning that has already been achieved.

Most children have peaks and valleys in their learning. One child may be a fine reader but weak in mathematics. Teaching a child as if all his learning were at one grade level is inefficient, for each subject must be assessed separately and the point of appropriate difficulty established so that the educational effort will be focused on that point.

Any teacher who wishes to will find it is possible to learn this essential skill of diagnosis, when there is the awareness of the need for something *appropriate* for every student.

In the classroom a master teacher will work with the total group when all may make responses at a level appropriate to their particular stage of learning. When the lesson will accommodate only one level of response, the teacher will work only with those children for whom such an assignment is appropriate. As a teacher gains experience with the custom tailoring of nongrading, she increases her skill in designing learning opportunities that will accommodate groups rather than individual children. By this method a teacher makes best use of time as an instructional leader while increasing the learning from interaction between students.

Team Teaching

Team Teaching has developed for the purpose of handling productively these same two essential factors: instructional time of teacher with learners and appropriate grouping of students for better instruction. In addition, team teaching takes into account the impossibility of any one teacher's being a highly-trained specialist in every subject. In the self-contained classroom with one teacher, any grouping for instruction, while highly desirable, necessitates some groups' working without the teacher. Independent work, therefore, is the result of necessity rather than the result of an educational prescription for this group of students to work alone at this point in their learning. Children should work by themselves because it is deemed desirable, not because the teacher is busy with someone else.

The self-contained classroom with one teacher also necessitates only one instructional personality with certain strengths and certain limitations. Even the master teacher is superb in certain areas, highly adequate in most subjects, but unavoidably limited in a few. With knowledge expanding at such an unprecedented pace, it is absolutely impossible for any one human being, no matter how brilliant or dedicated, to maintain maximum proficiency in the more than twenty different subjects which are taught in the elementary school, to say nothing of the expanding demands of secondary education.

It is possible to meet effectively today's rigorous educational demands through team teaching. Team teaching is *not* departmentalization as we know it in secondary education where one instructor teaches all the math, another all the English, another all the social studies. Team teaching is *not* a system whereby a group of learners is divided among a group of teachers with each assuming responsibility for only the learners assigned to him. Team teaching is *not* an administrative plan developed by the front office to determine who goes to whom to be taught what.

Team teaching is the assumption of responsibility for a group of learners by two or more teachers, through cooperative planning and cooperative teaching to achieve a mutually agreed upon objective, cooperative evaluation of the degree of attainment of that objective, which results in cooperative replanning, teaching, and evaluating. The word "cooperative" implies that each member of the teaching team is stimu-

lated, inspired, challenged, corrected, and complemented by the other team members.

No groups or teacher assignments are permanent, but continue as long as team members judge them to be efficient and productive. As a result, there is constant surveillance of the learning process, and lack of learning is not ignored or allowed to continue.

Teacher-Learner Relationships

The teacher with the greatest academic competence in each area is guiding the planning and learning with the other teachers assisting and participating, thereby increasing their competence as well as contributing their knowledge to that area. Students do not have long intervals of waiting until a teacher can get to their group. All students can work at the appropriate level of difficulty with other students from whom they also can learn. An assignment to a group does not become a "one-year sentence" but continues only as long as it is appropriate.

But what about the intangibles? What about the so important relationship between teacher and learner? Is this not sacrificed when a student has three teachers with whom he must become acquainted and to whom he must adjust? When the adults work together presenting a common front of support, guidance and consistent expectation, they increase their impact and influence; when adults pull against each other, the effect from the discord and lack of support is deleterious to the learner.

A teacher who finds a student unmotivated, listless or slow will have her opinion corroborated or corrected by her team mates. If corroborated, it becomes the cooperative task of the team to design a strategy to increase interest and work output. Three teachers working on the same problem make success more probable. If one teacher's opinion is challenged, all teachers seek clues in the student's behavior so they may develop a prescription to correct his lack of effort for one of them.

Each teacher has the obligation to lead in areas of competency, learn in areas needing strengthening, match professional judgment with other professionals, share the responsibility for directing the education of learners, have the burden of the difficult learner eased as others assist with such a student and to continually develop increased competency in educational decision making.

Nongrading and team teaching have been designed to eliminate the discordance of the traditional practice with current research in education. These innovations are congruent with current knowledge about the learner and his process of learning and have resulted from the application of that knowledge in twentieth-century education.

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Creativity in Learning

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Within the past decade or so, various claims have been advanced concerning creativity, some well-established and others unwarranted. In general, a creative person is described in an irresistably favorable light so as to give an impression of a new creation, a new ray of hope. Upon a closer examination, however, we realize that this glowing picture is not particularly new. In fact, it looks like a newly-painted picture of the old ideal American—a pioneer and an explorer—restless, searching, dreaming and always building for the future. It also reminds us of a scientist, an inventor and a discoverer of new ideas, productive and daring.

As such, the current description of creativity might be nothing more than an updated version of the spirit of a pragmatic and anxious society of the United States, and the surging interest in this topic might not be anything more than a plea for this familiar ideal of rugged individualism of early America now lost in a contemporary, corporate society. Accordingly, the seeming generality of the concept of creativity should be taken with a grain of salt. Otherwise, we could mislead ourselves in believing something to be as universal which may in fact be meaningful only in the context of our culture at this particular moment. Emphasis and values placed upon creativity might be more transient than they look.

Now, it is perhaps wise to distinguish four aspects of creativity to avoid confusion. We may be discussing a creative *person*, his abilities, personalities and other characteristics. Or we could be interested in the creative *process*, the birth, growth and death of an idea. Or our interests may be in studying a creative *product*, the end result of known or unknown efforts. Or, still further, our concern may be with the environment (*Press* in psychological jargon) which nurtures or inhibits creativity.

A Creative Person.

In this sense, the word *creative* refers to a person's traits and characteristics and, most often, to his abilities. Such abilities seemingly consist of several different dimensions which, in unison, would characterize a creative person. One of these dimensions is *sensitivity* or *spontaneity*. This is the quality shown by a person who is perceptive of existing problems and challenges and spontaneously raises questions for himself to grapple. In the problem-solving efforts, he would come up with numerous ideas, thus revealing another dimension called *fluency* or *productivity*. At the same time, his ideas will be characterized by *flexibility* rather than rigid adherence to a single category. As far as quality is concerned, his ideas are *original* or *imaginative*. They are new and unique at least to himself, but, further, these ideas must be meaningful and useful from the standpoint of the group to which he belongs. This aspect is characterized as his *inventiveness*. Also, his ideas will be

sufficiently refined and elaborated so as to allow at least a minimum amount of communication with the rest of the group (*elaboration or communicability*).

It must be self-evident now that outstandingly creative individuals are as rare as any outstanding decathlon athletes, both needing an optimum combination of numerous basic abilities developed to the highest degree. It is generally assumed that everyone possesses all of these abilities to a certain extent but it is obvious that not every person can be Edison or Poincaré or Leonardo da Vinci. Moreover, creativity in this sense is quite dependent on the degree to which such basic abilities (potential) are cultivated and developed. For this reason, understanding of the creative *press* (environment) becomes essential. Also, it is not surprising that, to be creative at a high level, a person must possess well-developed general capabilities to live and function satisfactorily in his group. Accordingly, a minimum level of intellectual abilities (usually represented by IQ) seems a *necessary*, if not *sufficient*, prerequisite just as a minimum level of physical abilities.

Is there any way to identify a creative person? As is true in many other realms of human activities, the best available approach seems to be to depend upon the accumulated knowledge and wisdom of a group, a society, or a race. If many different persons who have observed an individual over a long period of time agree to judge him creative, no other means can easily challenge such consensus. Unfortunately, this approach takes time and does not allow for early detection of creative talents. In addition, such agreement is seldom obtained for anyone except those few who are outstandingly creative. Do we have any other, simpler and more convenient measures that we could use in schools?

An honest answer to this question would be, no, not yet. There are several tests of creative thinking which have been tried out on various groups of subjects but they are far from satisfactory with regard to technical and practical requirements. These instruments are, at this point, experimental at best and any premature and blind faith in them could be harmful and misleading. It will be a long time before any precise judgments can be made on the basis of such instruments.

Creative Process.

It has often been suggested that the typical course of creative thinking runs from a period of intense preoccupation with a problem through a period of incubation to a final period of insight or discovery. In the first stage, such characteristics as interests (in the form of curiosity), motivation, and work habits would play an important role and this is why it is difficult to predict a person's creative performance from his creative potential alone. In the second, incubation stage, an individual turns momentarily away from his problem and lets his mind go. It is not clear what really happens during this period but such an interval of detachment seems to allow one's mind to get rid of too much involvement and too many preconceived ideas interfering with discovery of the best solutions. At the end of this stage, which may vary considerably in length, comes the "I have found it!" experience. Suddenly, it seems, all loose ends are tied and a restructuring of ideas occurs to yield a clear answer.

There are some questions about whether the same thinking process operates no matter what the field of inquiry. For example, it has been suggested that artistic creativity of poets, painters or composers represents a somewhat different process than scientific creativity of engineers, physicists or industrial researchers. In the former, through the process of creating, the creator is expressing himself and making something of himself known to the public while, in the latter, the creator acts more or less as a mediator between some public needs and available resources in the environment. He comes up with some novel and appropriate products, to be sure, but he does not have much freedom to express himself in any uniquely personal way. Further, there seems to be a third grouping falling somewhere between the above two, in which the activities of architects or mathematicians would be examples.

Creative Product.

Ordinarily, the quantity of products (or output) is much easier to record and examine than the quality and it is generally assumed that quantity is somehow related to the quality of ideas. This may or may not hold, depending upon other conditions of the *person*, *process*, and *press* of creativity. Perhaps the most experienced people in judging creative quality of a product are found among those dealing with patents. Although they have developed various procedures and standards on screening ideas, they are the first ones to admit that such analysis will always be a matter of human judgment, which is the only gauge for measuring invention.

In addition to difficulties inherent in any human judgment, it should be remembered that a group or a society can accept as creative those products of very unhealthy people, of fortuitous circumstances, and of an incomplete process. Often, therefore, *products* are poor indicators of the nature of the *person*, *process* and *press*. The inevitable value-centeredness of evaluation should also be recognized. Schumann's musical pieces and Van Gogh's paintings are deemed highly creative, while the most ingenious method of bypassing a bank alarm system is condemned by society. In trying to evaluate a product of creative thinking, we concern ourselves not only with the sheer newness or ingenuity of the product but also with the meaning such product has in the context of the value systems of the particular group or society.

Creative Environment.

The fact that we cannot escape the societal values in our discussion of creativity makes any simple and seemingly convincing sets of do's and don'ts for provision of an optimum environment (*press*) for creativity somewhat suspect. Creativity, per se, is neither good nor bad. An original child is in and of himself neither better nor worse than, say, an intelligent child, a weak child, or a blind child. All these evaluate adjectives take on their meanings only in relation to a set of values held by an evaluator either explicitly or implicitly. For this reason, we should be careful not to prescribe a model environment as a panacea to everyone before we have had an opportunity to re-examine fully what we ourselves live by and what we live for.

Some would undoubtedly argue that the only thing necessary is for us to reinforce creative behaviors, just as we have been doing with regard to intelligent behaviors. If, however, the structure of rewarding itself is not changed and if we continue to rely heavily upon extrinsic rewards of approval or disapproval, the results may be disastrous. We may indeed get what we want but apparently for wrong reasons. In the process, we will be stultifying children's natural curiosity by goading them with traditional external incentives such as grades, money or prestige. Whether we call the end products creativity, intelligence or integrity does not make a bit of difference, since we will be turning children into good students who are success-oriented, who follow instructions skillfully but blindly, who are afraid to make mistakes, and who are eager to please adults at any cost.

What we should be doing instead is to believe in children's intrinsic motivation and to nurture their sense of competence. Creative achievement for the sake of social approval is a poor second to strivings for competence based upon autonomous search for meaning and mastery. When, through our faith, our children are led to have confidence in their own creative potential and when, further, they are guided to realize that their life is an integral part of the great human heritage, we will have fulfilled our responsibilities as parents and teachers.

For Further Reading.

To see creative teachers at work, read the following books:

Ashton-Warner, Sylvia. *Teacher*. New York: Simon and Schuster, 1963.
Marshall, Sybil. *An Experiment in Education*. New York: Cambridge University Press, 1966.

For perceptive observations of what really goes on in the classrooms, see:
Holt, John. *How Children Fail*. New York: Pitman Publishing Corporation, 1964.

Kaufman, Bel. *Up the Down Staircase*. Englewood Cliffs, New Jersey: Prentice-Hall, 1964.

General discussions of creativity are to be found in such books as:

Lowenfeld, Viktor, and W. L. Brittain, *Creative and Mental Growth*. (fourth edition) New York: Macmillan, 1964.

Moustakas, Clark. *Creativity and Conformity*. Princeton, New Jersey: D. Van Nostrand, 1967.

Torrance, E. Paul. *Gifted Children in the Classroom*. New York: Macmillan, 1965.

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Acquiring Power in Reading

By ALTHEA BEERY and LENORE WIRTHLIN

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At her request Martha Stone had been given a transfer to an inner-city school for her seventh year of teaching. Aware of the frustrations, problems and pupil needs she would encounter, she sought the challenge of an urban situation. A dynamic principal, extra supportive services, the availability of many learning materials and the reputed cooperative spirit among the staff had influenced her decision.

Mrs. Stone knew the class would represent a variety of abilities, background, achievement and personalities. Since the future education of the pupils would depend largely on their ability to read and their attitude toward reading, she was making careful preparation for helping the children achieve in this part of the school program. At the same time, she knew that reading must have its setting in the total language arts area.

During the summer Mrs. Stone had attended a workshop to become acquainted with the new learning materials in addition to books—kits and programed materials, filmstrips, records, tapes, and manipulative devices—that would be available in the library which served as the resource center in the school.

Before school opened she spent some time exploring the community. Occasionally she drove through the neighborhood; she watched the daily newspapers for items of local events. She was seeking answers to several questions: What is the typical kind of housing? Where do these children play? Where do the people shop, work? Are there community resources such as museums, public library, parks and industries that might enrich the school's offerings?

During a preliminary conference she compared with the principal her hunches with his analysis of the needs of children and adults in the community, catching his enthusiasm for ways this school could best serve its people. After the principal had taken her on a tour of the building, she understood better the many educational opportunities available in the variety of multimedia resources and equipment, including a newly acquired listening post. She welcomed information about the in-school tutorial program, assemblies, trips, visiting teacher service, and the nurse's and doctor's schedules. Of special interest to her was the after-school enrichment program.

Looking over her own classroom, she explored the well-filled cupboards and bookcases, finding an interesting collection of paperbacks to supplement the library books; partial sets of several attractive readers; modern, well-illustrated texts in other subjects; and single copies on topics of interest to nine- and ten-year-olds. A recent set of encyclopedias, good maps, atlases and dictionaries completed the supply.

Launching the Program

From the beginning of school, knowing the value of early diagnosis, she studied the cumulative records of the pupils and conferred with previous teachers. She recorded for each child the information on his achievement and needs gained through discussions, informal reading tests, interest inventories and observations made as the children read. As she formed reading groups, she involved the children in deciding what they needed to work on in order to use reading as a tool for learning. She worked for a sense of personal involvement by capitalizing on their background and interests.

Mrs. Stone's concern for reading was evidenced in her careful planning. The personnel of each group, she knew, would vary in accordance with the reading purpose and the changing needs of children. She noted in the manual of one of the readers suggestions for developing organizational skills. Reference work could be a vital part of the program when they worked in interest groups. She planned special activities for a group of less able readers. Plans also included individualized instruction for Gary, virtually a non-reader. He dictated simple stories which he read after they were typed. He was gradually building and mastering a packet of word cards used in these stories. A volunteer was secured to give him more personal attention and help.

Cooperatively with the children, Mrs. Stone evolved a weekly program to provide guidance and time for the children to:

- 1) Select and read books for pure enjoyment
- 2) Share their reading in a variety of ways
- 3) Read orally in audience situations
- 4) Investigate, experiment, and discuss information found in books
- 5) Engage, under teacher guidance, in activities designed to promote growth in reading power
- 6) Develop appropriate techniques for reading in various subjects
- 7) Work in the library
- 8) Reinforce reading skills through practice activities, as needed
- 9) Learn more about the structure of the language
- 10) See the interrelationship of all the language arts.

The Program in Action

Many sources of help had been explored by the teacher for conducting and evaluating the reading program. Ideas gained in staff meetings, small study groups with her colleagues and conferences with principal, supervisor and psychologist were applied to meeting individual pupil needs. Professional books and issues of such magazines as *Childhood Education*, *Elementary English*, and *The Reading Teacher* kept her abreast of new trends in reading and supplied information on particular topics.

A visitor to the classroom noted the many ways in which learning situations were kept fresh, alive and meaningful. For example, on the science table were objects representing various types of levers—scissors, fire tongs, and nutcrackers. John and Wayne were engaged in following the directions of an experiment to find out how the effect of a lever could be measured.

On a particular morning time had been reserved to discuss what the children had learned about transportation. In one of the texts they had read the pages on the day's topic, "Carrying Freight by Air." Carol explained a large chart describing a new freight air route. She supplemented the legend on the chart with information supplied by her father. Grace and Joe reported on the kinds of freight which airplanes carry. Another report compared the cost of transporting goods by plane, train, truck and boat. The children listened to a taped report prepared by Ernest and Tony. Marcus challenged one statement, since the information he had read differed. A brief discussion on the relative reliability of the two sources followed. Jessie and Lilly shared their ideas in a series of pictures shown on the opaque projector, reading their written script as the pictures were projected.

After these reports, Editor Bill asked for contributions for the class magazine published once a month. During the discussion Mrs. Stone had jotted down notes. These, together with her observations of pupils' work habits, gave her a basis for evaluating the activity.

In a subsequent period Mrs. Stone worked with children who needed help in organizing and summarizing what they read. Since they also needed skill in attacking new words, they were referred to the chart on which they had previously listed ways to help themselves. In their individual booklets the children kept an alphabetical list of words which they now recognized.

During the week the class engaged in a wide range of reading activities. Several children pursued an individualized program; others worked with a multi-level reading laboratory planned to improve reading skills; some viewed a filmstrip on "How To Use a Dictionary." One group went to the resource center to locate information on new questions about transportation; another gathered round the listening post to hear a tape; four pupils made use of the tape recorder for evaluating their oral reading habits. Several pupils prepared a dramatization for the reading club. Gary worked with the remedial reading teacher.

Mrs. Stone noted that the children became completely absorbed in library books of their own choice. She observed improvement in the ability of most of the children to go to books for information, to evaluate reading material in terms of their purposes and then to use that information.

A conference with Gary's mother threw light on some of the causes of his reading problems. Together they planned ways for home study that would give Gary needed practice and help build his self-confidence. A follow-up conference in two months was agreed upon. Plans to invite other mothers for similar conferences began to take shape.

A Check on Progress

Mrs. Stone checked periodically the growth that children had made in reading in terms of their potential. She was finding solutions to such problems as that of the ten-year-old word reader who entered the class after attending three schools in five months. Using a pupil-team approach with interesting but easy material proved helpful. The child's name was placed on the waiting list for remedial help.

Mrs. Stone realized that a group of pupils needed additional help in developing skills in critical reading. Using both stories of high literary quality and informational selections, she guided the group through questioning and discussion to deeper interpretation and thoughtful evaluation.

From time to time, and again at the end of the year, she examined carefully each child's reading folder in which he kept samples of his work, a list of books read, and a self-checklist of progress made. After considering his work habits and his strengths and weaknesses, she wrote brief recommendations for the teacher of the next grade. She was confident that most of the children were more competent in reading, richer in the friends they had found in literature, more understanding of different kinds of people at home and throughout the world, and more secure in finding answers to their problems through reading. Best of all, they were enthusiastic about books and read them for personal pleasure as well as for information.

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Creative Writing

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Creative writing is one of the products of creative thinking. The child who is free to express his creative thoughts through any medium that he may choose will often select creative writing as his own individual manner of expression. He may, of course, decide to draw, to express himself through creative dramatics, or to elect one of the less frequently chosen modes of creative expression such as singing or dancing. Children in school or at home should have many options to control their own outlets of creative talent whether it be speaking, writing, dramatizing, drawing, painting, paper cutting, singing, dancing or some other process or combination of processes.

Before any one of these outlets can become a channel of expression that leads to a real product, a worthy and accepted idea needs to be aroused in the imagination of the child. The child needs to feel the impact and the worth of the idea before he can give his personal energy to the work. Usually, in school, someone else needs to accept his idea as worthy in order to lend encouragement to the child as he works if the child is to be expected to offer the results of his efforts as something shared.

Creativeness Not Always Easy

Creative writing, in school, is one of the outlets most frequently discussed for creative thinking. Recently creative speaking has been given more emphasis as the verbal companion of writing. Of the several products of creative thinking, oral and written composition may be the slowest to come, the most difficult to prepare to the point of proficiency acceptable to the child himself, and for many children—particularly those who are shy—the hardest to share. While we have learned to accept art in many forms of individual expression, in literate society standards of speaking and writing are high hurdles for children to jump.

To speak creatively one must confront his teacher and his peers with his private thoughts. Frequently he must bear disapproval if the utterances wander very far from the expected or if the way of expressing ideas deviates very far from the accepted. Fortunately, a child often feels the pleasure of a happy audience response and is encouraged by that response to continue on to further creative oral composition.

Teacher's Role in Creating

The role of the teacher in the creative verbal process is vital and complex. The teacher can, by the impact of a personality that encourages trust, make a working setting favorable for free pupil output. Through understanding and appropriate study, the teacher may learn how to

foster successful expression in verbal skills, but personality and knowledge are, to begin with, essential concomitants of good teaching of creative expression.

The teacher with a favorable attitude and imaginative approach regards every child as one with creative potential. No child is expected to fail; no child has ideas too meager to express; no child feels that either his teacher, classmates, or his parents are predisposed to think of him as an uncreative, unproductive person.

Happily, the school as a working scene is changing in that, along with satisfaction in other means of creative expression, there is for children enjoyment in verbal work as well. Competency in verbal expression has long been a prerogative of adults who prepare for oral or written responsibilities to choose the points of view and the boundaries of their subjects, if not the subjects themselves. Adults have had the prerogative of choosing the most facile or suitable styles of speaking or writing; the time and place of work; and tools or auxiliaries that please the senses, while the speaker or writer tries to symbolize that which is not wholly expressible. Furthermore, the adult has the right *not* to speak or write if he so chooses.

Children, too, deserve choices of topic, style, time, place, tools and property rights. They deserve these options even more than adults because, unlike adults, all children in school are expected to try to speak and write creatively. When all children are considered, personalities, talents, and skills vary tremendously; therefore, variance in working methods and attitudes should be expected and allowed.

Both the topic and the collection of appropriate communication skills constitute the rationale of the task. The logical topic for the individual child is the one within him that needs to be expressed. When creativity is the focus, the classroom group is not the organization gathered for the task; the individual is the creative agent. Whether the product is a song, a drawing, a creative drama production, a spoken story or a written composition, privacy is a prerequisite. Privacy is hard to come by. Though group products make essential contributions to society, private works become the masterpieces of art. In the elementary school every child has the right to try his hand at making a child-type masterpiece.

To help a child choose a topic, a teacher needs imagination, sensitivity to children's interests as individuals, and a constant awareness of the need for children to collect ideas through real experiences and reading. Every experience, in school and out, becomes a part of a child's stockpile of ideas. Other things being equal, the child with the fullest experience, real and vicarious, will be the one most able to select a topic and to write. But "other things" are not equal, as every teacher knows.

To write, the child needs to know how to convert ideas into the symbols of the written language. Even if he has an idea he is eager to express he may find that it is jammed somewhere between his imagination and the paper, though he has chosen personally his topic, time, place and tactical materials. The child needs language skills to free him to write. He needs words to express his thoughts; control of the sentence

patterns in which to embed the ideas, spelling and handwriting ease; and experience with forms and styles of writing.

Words and sentence patterns come early to the child and if he has grown up in a community where he has been a part of the speaking social group, he uses them freely, rapidly and well in oral communication. Much later he jumps the hurdles of concentrating over a period of time on the written task, of spelling the words he already knows and really wants to use, and finally of actually drawing the symbols to represent his thoughts through handwriting, a complicated skill that is a long time becoming automatic. The irregular pacing of these skills among children shows diversity of abilities and combinations of abilities that make skill sessions every school day, apart from creative writing sessions, essential for most children.

Practice in Skills

To prevent psychological and physical curbs on the free flow of ideas during creative writing times, emphasis on skills is relegated to other learning times during the day. The child who needs help during his composing time has resources at hand when he needs them. Understanding teachers are the most obvious, versatile and valuable resources for children who are writing.

Less obvious, but nevertheless operating in the young writer's behalf, are the stories, books and poems within the daily experience of children. Unaware that the selections from literature written for them, read to them, read by them have become a part of their own store of language experience, children use adaptations and even whole borrowings in their own personal writing. Although it is difficult to understand the processes through which such literary transactions take place, it is common knowledge that those who read most are usually those who write best. Who can enumerate the parts of the experience "input" that combine to produce the language "output," the product of creative writing?

The child's poem, the child's narrative or the child's expository writing is his own. He should decide its fate. The purpose for writing helps to determine the final disposal. When children write in order to speak, speaking is the object, the writing only a means, and this written composition is expendable because it has served its purpose. When children write to "publish" ideas for others to read, the writing is probably judged more discerningly by the writer as either worthy or unworthy of standing up to editorial criticism. If the composition is turned over to others—the teacher or pupils—for further evaluation, editorial comments are considered by all concerned in the "publication." When a child offers his creative writing to others to read, he accepts the standardizations of all written language in order that written words will communicate faithfully the writer's intentions.

It is at the point of evaluation that the teacher through attitude and understanding becomes involved with the success of the young writer. Creative writing is personal writing and it is respected as a part of the child who produced it. To encourage him to continue to talk, to read, to interpret and to express uniquely his resulting ideas in writing is one of the most rewarding experiences of teaching.

Questions Needing Answers

Writing as a way of expressing creativity becomes for some persons their most creative process in school. For others, different products give more satisfaction. In school all children should have the opportunity to experiment with the development of skills to express their creative talents in every known and perhaps in some yet undiscovered ways. To treat the varying interest, differing rates and qualities of skill development, and to give adequate attention to all of them is the objective of the elementary school. Questions arise about all phases of creative expression. The following questions, limited mainly to creative writing, represent those asked now by modern teachers.

1. To what extent should children be given their choice in the mode of creative expression?
2. How can we really know the interests that can be expressed in writing by children?
3. If we really could discover these interests, how can we guide children in their selection of topics most appropriate for sharing with other children?
4. How can we provide freedoms of time, place and materials of writing?
5. What are the most appropriate ways of introducing young children to form and style in literature?
6. When and how is it most helpful to give children editorial help in their writing?

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Science: Middle School Years

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Since the middle 1950's, and especially since the early 1960's, there has been considerable change in emphasis in elementary-school science teaching. There are several factors which account, in part, for this shift. One, of course, is the change in the climate of opinion which has followed man's achievements in space and the widespread questioning of educational procedures which accompanied the early Soviet successes in this direction. Another factor has been the increased availability of money for scientific materials for schools and the consequent upgrading of school equipment. A third factor is that science is receiving increased emphasis in the programs of teacher-education institutions on both graduate and undergraduate levels, and consequently beginning elementary-school teachers are better prepared and more eager to teach science. Still another factor which has played its part is increasing awareness by the general public of the immediate and potential seriousness of world-wide and community problems—air pollution, for example—which have scientific implications.

All these and others have brought about increased awareness not only of the importance of the products of science in the life of the average citizen, but of the even greater importance of the need of the citizen to understand something of the processes of science which have produced such products.

Cultivating Scientific Thought Processes

It is not new to say that people should be taught something of the attitudes, practices and thought patterns of those individuals called "scientists." What is new is that constructive and deliberate efforts are being made to develop procedures to make this teaching effective. In other words, we have *talked* for a long time about the need to teach scientific thought processes. Now in the last few years we are *doing* something about it.

There seems to be a trend in recent years to teach more genuine science in elementary school and less *about* science. The nine-to-twelves, in particular, are being asked to collect information or data from experimentation and from this data to suggest explanations for what they have observed, to establish rules or generalizations and to test their generalizations in new situations.

An example of what is meant here is the procedure suggested in one of the early Elementary Science Study units, the one entitled "Kitchen Physics,"¹ since revised. In one part of this unit, children were given some plastic bottles and a set of five stoppers. In each stopper was a hole of a different size. "Will water run out faster through the larger holes or the smaller ones?" "How much difference will the size of the

¹ See reading list at end of article.

hole make?" "How can we tell accurately how long it takes for the water to go through each hole?" "How can we keep track of the results?" And immediately children are confronted with all the problems of accurate observation, data recording and variability among data which must be thought out.

One of the important functions of the teacher of nine-to-twelves is to ask questions, not questions that children can answer by rote, but the kind of questions that make them think before answering. It isn't very important that they know that the time of emptying a bottle is inversely proportional to the area of the hole; it *is* important that they see that the bottle must be filled to the same level for each measurement. It isn't important that everyone records his data the same way; it *is* important that data be recorded in a meaningful way.

Another important function of the teacher is to help children find problems that seem to them to be worth solving. We have heard a good deal about having children work on their own problems. This does not mean that all the problems must come from the children; it does mean that children have to accept problems as worth working on. It does not mean that all problems must be of immediate practical importance; it does mean that children have to get interested in them and even excited about them.

Importance of Mathematics

It is sometimes said that mathematics is the lifeblood of science. This is a pretty formidable statement. What it boils down to is that teachers should take every opportunity to encourage children to use number words. How many inches? How many minutes? How many cups? There are other kinds of number words. This plant is larger, or smaller or heavier, or lighter than that one. Children are to be encouraged to see the difference between saying "this is a big plant" and "this plant is bigger than that one." Children can record data in many ways besides merely numbers. Graphs can be made of strips of paper or tape.

In many of the newer curriculum materials in science, metric measurements—centimeters, liters and kilograms—are being used. It would be better for teachers to start using them without fuss, simply saying, "In science, people often use a different measure of length (or weight or volume) than we are used to. A centimeter is just another way to measure length. This ruler measures length in centimeters. Let's use it." And it is better not to get children involved in converting from one system to another. This complication in learning can be left until high school or college.

Earlier Basic Concepts

In line with what was said earlier, that modern thought is to teach more science and less *about* science, basic concepts need to be introduced much earlier than they usually are. One significant new series of science textbooks² introduces the idea of molecules (little parts) and the motion of molecules in first grade! This is not as startling as it looks, when we stop to think of it. "Molecule" is only the name of something, and intrinsically no more difficult than a three-syllable name such as "Margaret." But to understand all that is meant by "molecule" one must have time to live with the idea. So the word is introduced early and the first

² See reading list at end of article.

ideas associated with it are simple. Later the word is brought in again and again, each time in wider and wider connection.

Children, teachers and those who write curriculum guides, need to distinguish clearly between experiments and demonstrations, though there is no need to burden children with a *formal* distinction here. In an experiment, the experimenter, by manipulating material objects, is seeking an answer to a question. An experiment always involves a question, a question that may be implicit or explicit, written down or carried in the head of the experimenter; but it is always there and the answer is unknown to the experimenter. (It is immaterial that someone else may already know an answer.)

A demonstration, by contrast, does not involve an unknown answer to a question. The demonstrator already knows how the demonstration is supposed to work and what it is supposed to show. A demonstration says, in effect: "This is what I mean. Look, I'll show you." Demonstrations are exceedingly useful in science teaching, but they are audiovisual aids, not experiments. They take a concept already known and make it more acceptable or more vivid or clearer to the learner, but they do not solve problems.

Experiences: Structured, Unstructured

There seem to be two general kinds of experiences: the relatively unstructured kind and the kind which are pretty much structured. ("Structure" here refers to classroom organization, not to the design of the experiment itself.) The unstructured kind are those that David Hawkins³ refers to as the "messing about" kind.

Let us take for an example of a "messing about" situation one which might be used in a unit on magnets. The teacher wishes children to get hold of such ideas as: "magnets have poles," "like magnetic poles repel each other," "unlike poles attract each other," "magnets attract some things but not others," "magnets are useful," "magnets attract through space." However, if these ideas are simply taught by reading about magnets or even by demonstrating magnetism, they tend to remain abstract. What is needed by the children are many direct experiences with magnets. In other words, children need to get their hands on some magnets and try all sorts of things with them first.

So the teacher collects some magnets, large and small, strong and weak, all the shapes he can find, magnetic toys and gadgets, nails, pins, samples of many kinds of substances. Having enough of these for each child or small group of children, he allows the children to handle, to try, to play, to "mess about" or to experiment with magnets as they will. The purpose of all this is to build a background of experience with magnets and of concepts about them; what they are, how they act, what they do. The teacher's role here—and it is a difficult one—is to move about, be helpful, ask questions, suggest further moves, supply information but not to direct. This requires a teacher who knows something about magnets but who can refrain from telling all he knows! The object here is to get the children involved, to arouse curiosity and motivation, not to frustrate.

Gradually the need for guidance emerges and the children gradually move by various paths toward a more structured and organized study.

³ See reading list at end of this paper. Hawkins' article is one that should be read in its entirety.

The Teacher's Attitude

If the teacher truly understands and appreciates the value of self-discovery and pupil involvement; if he is genuinely pleased to find evidence that pupils think for themselves, his attitude speedily communicates itself to children. Such a teacher's classroom is a place for exciting discovery. An authoritarian manner on the part of the teacher soon results in a classroom where science concepts are set out to be memorized and where the principal activity of the children consists in referring to "the book." A better teacher would furnish convincing and acceptable experiential evidence for the concepts learned.

In every good classroom there will be a wide variety of activities. Sometimes there will be relatively unstructured activities as outlined above. At other times there will be highly structured activities where specific directions are followed or where all read a textbook together. Sometimes there will be activities involving looking up information from reference sources. No one plan should be used exclusively.

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Outdoor Education

By REYNOLD E. CARLSON

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The term outdoor education has come to be applied to all those experiences that bring pupils into direct contact with the natural environment as part of the learning process. Outdoor education may take place on the school grounds, at neighboring parks, specially developed nature centers, farms, forests, garden centers, outdoor laboratories and resident camps. Its primary concern is not to add new subject matter to the school curriculum but rather to add a new dimension to what the school is already teaching by using the resources of the natural world.

The concept of outdoor education is not new. Jean-Jacques Rousseau, Johann Pestalozzi, and Herbert Spencer were advocates in the eighteenth and nineteenth centuries. John Dewey emphasized the importance of relating learning to experience. Good teachers throughout the years have used the resources of the environment to deepen the sense of reality in learning. It is psychologically sound to provide direct experiences along with abstract learning. Research studies in outdoor education tend to confirm the soundness of this approach.

More People, Same Outdoors

There is in America today an increasing urgency to expand outdoor education, an urgency resulting from the changing needs of children and adults in a changing society. We are now a nation of two hundred million people, of whom more than two out of three live in urban areas. If present trends continue, by the year 2000 our population will probably have swelled to more than three hundred million, of whom more than 80 percent will live in metropolitan areas. Fewer and fewer of the American people—perhaps only one person in fifty—will have any responsibility for growing the food and fiber upon which we depend. Our culture will become even more urbanized, with our population increasingly divorced in everyday living from responsibilities related to the natural environment. At the same time we will have more material comforts and more money for discretionary expenditures than ever before. There will be more leisure as the work week decreases and modern technology increases per-hour production.

Boys and girls now in elementary schools will, long before the year 2000, have many special problems to solve, some of which will relate to natural resources, personal health, leisure and the very quality of the communities in which they will live. The big problem of overcrowding, with all the concomitant ills of air and water pollution; problems of transportation, erosion, and ugliness, will have to be met. The only times when most people will have a direct contact with the natural environment will be during leisure; but this is true for many persons even now.

The numbers of persons engaged in outdoor recreation, now booming, will treble by the year 2000, if predictions of the Bureau of Outdoor Recreation come true. Even now the number of persons who make visits

to parks, seashores, mountains and lakes during summer vacation, are straining the facilities and accommodation resources to dangerous limits. Every summer more and more families and bigger ones are pouring into national parks, campgrounds, seaside and lake resorts.

Need for Conservation Education

Heavy recreational usage can quickly destroy the natural resources unless our people as a nation of good citizens learn to respect the land and use it wisely. And how is this need to meet an urgent, growing problem to be accomplished? Outdoor education in the schools today can help build those attitudes that will preserve these lands for the tomorrows and, in addition, enrich the lives of the users. Even those who will have no direct responsibility for resource management will still be citizens in a society that must make decisions about resource use. What the citizens decide about air and water pollution, the protection of open spaces, the use of forests, and natural beauty will influence the quality of living in this generation and in the future.

Those who encourage the growth of outdoor education know that some of the concepts and knowledge about natural environment can best be learned in direct relation with that environment. Books and even the best audiovisual materials are seldom as effective for learning as the outdoors itself. Learning outdoors should not consist of isolated experiences but should be planned, conducted and evaluated so that the greatest contribution to education is made. Attitudes as well as information are essential. Excursions that begin inside the schoolroom with reading, viewing films, slides or photographs can be a continuous, exhilarating learning experience when carried forth out of the schoolroom into the welcoming outdoors.

Outdoor education is not confined to any grade or age level. Opportunities to use land for learning may be offered from kindergarten on. Subject areas that may benefit from learning outdoors include sciences, art, social studies, language arts, health, and physical education. The experiences may range in complexity from carefully developed ecological studies to simple visits to farms or parks. The projects may require nothing more than sharpened senses, experiments and the use of varied measurement devices.

The most frequent obstacle to effective outdoor education is fear on the part of the teacher. Sometimes teachers, even though they recognize the value of outdoor education, are reluctant to go outside the classroom because of the problems of inadequate supervision and legal responsibility. All too often teachers feel that they are inexperienced in coping with discipline in the informal outdoor setting. Some teachers believe that they lack the outdoor knowledge that can make meaningful experience for the children.

Guidance for the Teacher

The teacher who really wants to take advantage of the countless learning opportunities and the healthful benefits of frequent and varied excursions outside the classroom can find information and support from many sources. There are numerous publications with program suggestions. The many field courses offered by colleges, universities, conservation organizations and public agencies make it possible to get first-hand

experience. The teacher with a personal interest in the outdoors may with time and experience develop a vast fund of information.

The young teacher who has the initial attributes of being able herself to observe, speculate and learn with the children has made a good beginning. For those teachers who feel that they are deprived of opportunities for the best outdoor education, there is consolation in the example of the teacher who, when faced with having to take a classroom of city children on what seemed to be a boring and fruitless walk to a barren park on a dull day in late winter, had the imagination to make of that excursion one of the most exciting episodes of the year. Her imaginative suggestion was perhaps born of desperation. She asked each child quietly to observe both going and coming something of natural interest that one would not ordinarily notice and to report on it when they had returned. That was a quieter than usual walk but the return to the classroom was bedlam! Each one had found something or seen something no one else had noticed. One child had noticed that the clouds were ruffled in the sky; another noticed a plant pushing a stalk of leaves up through hard ground (how could a plant be so strong?); another had found and brought back a perfectly smooth pebble. How did it get that way in the rough city?

One rewarding experience, a teacher will find, leads to other good outdoor excursions with children, who will themselves as they are learning lead the way in exploring.

What Children Learn

Outdoor education is based on the assumption that direct experiences may be desirable or essential for some aspects of learning. This assumption is true only if we so plan these experiences that they make a contribution. Just being out of doors in contact with the environment does not of itself insure desirable outcomes. What we must develop is perception on the part of the learner. We want the learner to perceive relationships of living things to each other and to the physical environment, the processes of development or how things come to be, and the way in which man also is a part of his environment. There is a natural bud of curiosity in children that needs but a drop of encouragement to make it flower.

Let us consider the following illustration: A visit to a gravel bar on a running stream presents a host of possible studies that range from simple experiences for younger children to observations in depth for college students. Some persons would see only sand and stones and perhaps identify a few stones by name. When, however, we look at the pebbles as processes rather than as static substances, we enter an entirely new dimension of understanding. Enos Mills wrote that one could start with a pebble and open the whole universe. Any concern with the nature and origin of materials raises questions of chemistry, geology and even astronomy. How pebbles differ in shape and size opens questions regarding the physical forces that shape not merely the pebbles but the very landscape. The fact that processes of shaping are still going on around us can be observed through the action of wind, water, and temperature. It is but a step to the discovery of the relationship of these processes to soil building, plant growth, and animal life. Man's relationships to these natural phenomena is another easy step in learning. How his food and other economic benefits depend on the processes observed may be indicated.

This procedure, it should be noticed, is not object teaching, but is concerned with interpretation and observation. The situation provides opportunities for sharing information and should stimulate the imagination of each participant, who brings to the experience his knowledge and his past experiences.

Another way to consider outdoor learning experiences is to recognize that in the classroom there is a tendency to approach science and other subjects as organized bodies of knowledge in planned, orderly sequences. In outdoor education with experiences selected to contribute to the classroom learning, the approach is quite different. Starting with what can be observed with any of the five senses or observation as to what one can do with the things found in one's particular environment, the class proceeds to place the knowledge gained into its context. Everything has a story to tell and this story has a contribution to make to what is taught in the classroom. This, an ecological approach to the outdoors, is trying to understand the total relationships of living things to each other, to the physical environment, and to man.

Outdoor experiences should help in the development of aesthetic appreciations. It is to be hoped that every child comes back to the schoolroom with some sense of the orderliness, majesty and interrelatedness of the universe and a growing appreciation of beauty of the landscape, sky, trees and flowers. It might also be expected that there would be in the outdoor setting opportunities for music, art and dramatics that would relate to and deepen the appreciation of the environment. Here, without oversentimental approaches, are opportunities to instill in children a sense of value and pride in our outdoor heritage.

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Language in the Middle Grades

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Language can be a fascinating study for middle-grade children if teachers look around in the world for cues and draw upon the many fields of language study. An important trend in the middle grades is helping boys and girls understand the significance of language and recognize some of what is happening to it today. Knowing something of the spread of English in our time to all continents could be the starting point. Children would be interested to know that English is closer to being a world language than any language has ever been. English is the language used to signal planes in and out of all major airports; it is the language of jazz and of sports everywhere. India, Pakistan, the Philippines and some new African countries use English as their language of government because it is known by the educated people of the countries and because, in each country, there are so many regional languages and dialects that communication is next to impossible. Also, scientific and technological information these countries need in order to make their advances into the twentieth century is available in English but not in their native languages. The whole world's accumulation of knowledge is available in English in our libraries.

Children would be interested to follow newspapers to see what is being done with language. Much of the most important work of the world is carried on through face-to-face talk. Heads of state and emissaries all over the world exchange visits to confer on economic, social and political problems. To provide boys and girls with a really vital language program we need to lift our eyes from textbook pages and look at living language in the lives of real people.

Language Backgrounds

An important present-day emphasis is on the interrelationships among the language arts themselves and on the relationship of language to other subjects. Language and the content of the social studies are unmistakably related. Teachers are being encouraged to draw upon both history and literature to help children understand the many ways in which language has influenced the life of man, a resource brought out in studies of the newly emerging nations of Africa and even more clearly in the study of America.

Attention to language can begin, from the historical point of view, with the languages brought by early settlers into various regions. Germans came in great numbers to Wisconsin and the St. Louis area, Scandinavians to northern Minnesota and Spanish-speaking peoples to

Florida and the southwest, leaving a residue of place names, names for foods and other expressions still current in these areas. Fifth- and sixth-graders learn in American history that Captain John Smith and his followers, Miles Standish in New England, Calvert's Marylanders and others brought to America the English of Shakespeare's England. The establishment of English as the language of North America was one of the significant happenings of the eighteenth century.

But the people who came for various economic, social or religious reasons to the cultural melting pot brought a great variety of languages.

Dialects of English

Linguistic geography and dialectology have something to offer middle grade children. Through stories, poems, songs, and perhaps through recordings children learn to recognize and savor the dialects of New England, the Pennsylvania Dutch, the hill people of Kentucky and Tennessee. Stories from England, Ireland, Australia, India and Africa help children see that not all speakers of English speak identically. They can learn to respect and appreciate differences but come to recognize the appropriateness for themselves of the "standard English" the school strives to teach them to use.

Older children need tactful but continuous help to see that the language they use influences social and vocational life. Teachers are being encouraged to look with children at the language used in various vocations that interest them and to find ways to motivate children to work hard to *add* to their repertoire the quality of English that is good anywhere in the English-speaking world. Teachers are learning to develop this motivation without undermining a child's respect for himself or his family.

What We Do with Words

New programs in the language arts give considerable attention to words—how they come to be and what happens to them. The lexicographer becomes increasingly important to children when they learn that a dictionary is a record of the language and the way people use it. The dictionary cannot hold a language still, because language changes as things happen to people. New words are added to English at a phenomenal rate because of new knowledge and new experiences in all realms of science and technology and the more intimate social and economic realms of daily living. Children can watch for new words, most of which are coined of old parts to serve new needs. Some words are being dropped and some are taking on new meanings. "Capsule" has a new meaning for children born into the space age. Children enjoy being language sleuths, watching for new words or for archaic or obsolete words and for changes in old meanings and patterns.

Again, literature helps. As early as kindergarten, with Mother Goose rhymes, children can become aware of old and new meanings and uses of words at various times and places. They may want to give attention to the way in which skillful writers use words to paint pictures, create moods, cause us to reach out in empathy or spring into action.

Tones and Stresses

New materials in the language arts are calling children's attention to the way language operates in human interaction. The sounds in a word tell nothing by themselves; sounds arranged in a word tell only a little. Words arranged in strings—sentences—tell far more. But even here, the words alone do not completely carry meaning. The use of pitch, stress and pauses plays an essential part in communication in English. Children enjoy playing with such a simple question as, "What are you doing?" and discovering that one can ask at least five questions with those four words, depending upon the tone of voice of the questioner and where the stress is placed.

Another revealing experience to children is that of analyzing what is communicated when a parent or teacher says, for example, "Come here, Tom!" Said in a lilting voice by a person who is relaxed and smiling, the words carry quite a different message than they do when they come soberly from an unsmiling face. And when they are said angrily or sternly by a speaker whose countenance is dark and forbidding and whose bodily stance is one of tension and anger, the message is vastly different. Thus, as they experiment with little-considered dimensions of communication, children are made aware of important aspects of communication in human relations. They may gain in ability to interpret some of what they read and may be more conscious of overtones and undertones in skillfully written materials.

What About Grammar and Usage?

There has been great dissatisfaction for some time with the teaching of grammar, particularly in the intermediate grades. Consequently, scholars have at last been called upon for help to develop better materials and methods. Need is great for new ideas in linguistics, because research demonstrates clearly that traditional teaching of grammar has had little or no effect on children's speaking or writing. If this is true, why do we teach it at all? Grammar for children should aid them in saying and writing more clearly what they want to express.

Psycholinguists who study what the preschool child does as he masters his language tell us that many little children use all the basic forms of English sentences by the age of three. All children learn the grammar of their language by the age of eight. They put words together in sentences the way the adults in their home environment do. The child growing up in the home of a college professor of English handles words as his parents do and the child in a home where a substandard or deviant dialect is spoken learns the grammar of his home thoroughly. A doubting teacher will discover the truth in this when trying to change the speech patterns a child brings to school. The child has learned his language so thoroughly it is a part of him; the dialect he speaks was learned from those in whom his security is centered, those who clothe, feed and care for him; and he does not respond comfortably to efforts to make him different from them in his methods of communicating.

The teacher's goal is not to *change* what the child has learned but to motivate him to *add* standard English to his repertoire.

Recent studies indicate that the best measure of the maturity of a child's language is his ability to expand and elaborate sentences. Children, because they generally enjoy playing with language, tossing it about and trying different ways of saying things, can be helped to understand English sentences, because there are only three basic kinds:

1. The sentence with a transitive verb—*Dad brought a pizza.*
2. The sentence with an intransitive verb—*He hurried home.*
3. The sentence with a linking verb—*It tasted good* or *It was hot.*

With a kernel sentence such as any of these a class can start by substituting other words, then expand the sentence by adding *when*, *where*, *why*, *how* or *what*, as the case might demand. Added parts would be clearly movable, as "*Last evening*, Dad bought a pizza for our dinner," or "Dad bought a pizza for our dinner *last evening*." Obviously, the best sentences to work with are live sentences created by children. While learning to transform sentences, children can be introduced to some of the terminology of grammar. Perhaps the teacher says, "What other verb (or noun) could we use here to paint the picture more clearly?" "How could we better describe this person so our readers or listeners would feel that they know him?" Some of the newer terminology of the linguists is useful if one cares to utilize it. *Noun phrase* and *verb phrase* are not difficult concepts. *Determiner* may mean more to a child than *article*. Children will have no difficulty with the concept of *modifiers* or *head words* if they are used in situations in which meaning is clear. A number of scholars are inclined to recommend only this kind of grammar for the elementary school, leaving all that is more abstract in the system until junior high school.

In many schools and for some children in all schools, it is more important to work on usage than on grammar. A child's social and economic opportunities will not be based upon the amount of grammar he knows. His whole life may be influenced, though, by the quality of his usage. Schools are obligated to help each child learn to use language which will not deprive him of acceptance in any area of life which he aspires to enter. The child who first learns a less acceptable dialect needs all the motivation and kindly reinforcement the teacher can give him to add to and to become comfortable with a standard of English that will be good anywhere.

Reading, Reading, Reading

Probably the best and most important way for children to expand and refine their use of language is through reading. Individualized reading—quantities of it—has come to be recognized as not only a need but actually a *right* of all children. The more a child reads the more accustomed he becomes to the many ways in which people express ideas and the many purposes language serves. The more a child reads the more he expands his vocabulary of words and meanings and his repertoire of techniques for getting across the shades of meaning he wants to express.

Teachers in the middle grades are constantly warned not to neglect the development of study skills. There are innumerable guides to help teachers remember what skills need to be taught—note-taking, outlining,

gathering bibliographic data—but skills can be taught in any material; they need not be from a reading or language textbook, but taught just as well in social studies or science materials. But *they must be taught*.

The teacher's problem is to know children well enough to help them find books to fit their interests and needs. Reading aloud to children helps to develop their taste for what is good.

We Must Also Write

Teachers are being encouraged to provide many opportunities for children to write what they want to write—creative writing for fun and personal enjoyment and writing for all sorts of practical purposes. The emphasis—although form is not neglected—is put on subordinating form to content, to ideas. Each child should have opportunity, from time to time, to share what he has written with the teacher individually, to find the points of greatest value in what he has done and to consider ways of improving it. Such individual conferences are the golden opportunities to help each child become a writer. Here, as in reading, the trend is toward giving more individual help.

Some Conclusions

A language program for middle grade boys and girls can be an exciting program based on real uses of language in a real world of human interaction. It should start with attention to language in the world outside the school and should always be related to it.

Trends in the language arts are clearly pointed toward making the study of language in school as exciting as children obviously find language outside of school.

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Discovery in Teaching Mathematics

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One of the aims of education is to teach children to think. The ability to read a problem, to identify the elements given and to relate these elements to known principles and generalizations are important skills in the thought process. For example, what are the elements present in the following problem which will aid the individual in thinking through the solution? "Jimmy left for school this morning with 11 pennies. On the way to school he purchased a pencil for 5 pennies. How many pennies does he have left?" Questions will establish the elements present. Is a sum present? Yes, 11 pennies. Is an addend given? Yes, 5 pennies. The equation, then, is $\square + 5 = 11$. To solve, the equation is $11 - 5 = 6$. It is necessary that, to carry the thought process to completion, the child understand terms and their relation to processes.

The child's learning by discovery requires guidance from the teacher. Methods of teaching, however diverse they may be, all involve directing the attention of the pupils to relationships and patterns. The emphasis then is to challenge children with the finding of a new algorithm, using *new* information with *known* generalizations. For example, almost everyone when asked to find the product of 45×45 , proceeds in this fashion:

$$\begin{array}{r} 45 \\ \times 45 \\ \hline 225 \\ 180 \\ \hline 2025 \end{array}$$

As children solve examples with this pattern (squaring a number ending in 5), they might be challenged to identify patterns within the solution which happen over and over. Can one use these ideas to come up with a new algorithm? What are the digits in the units and tens place each time such a number is squared? How can one juggle the numbers in the tens place in the multiplier and the multiplicand to produce the numbers in the hundreds and thousands place in the product? Does this manipulation work for all 2-digit numbers ending in 5? What is the product of 45 squared? of 75 squared?

$$\begin{array}{r} 45 \\ \times 45 \\ \hline 2025 \end{array}$$

$5 \times 5 = 25$
 $4 \times 5 = 20$

$$\begin{array}{r} 75 \\ \times 75 \\ \hline 5625 \end{array}$$

$5 \times 5 = 25$
 $7 \times 8 = 56$

What happens when the discovery approach is used? Children begin asking questions and are full of suggestions that will deviate from the normal sequences in a process. Teachers may expect many questions they may not be able to answer. However, each question can be used

as a way to gain the following interpretation. In $76,854 \div 98$, how many have thought to divide by 100 instead of 98, and replace the difference, 2, for each group to balance the operation?

$ \begin{array}{r} 100 \overline{) 76854} \\ \underline{700} \\ 68 \\ \underline{+14} \\ 825 \\ \underline{800} \\ 25 \\ \underline{+16} \\ 414 \\ \underline{400} \\ 14 \\ \underline{+8} \\ 22 \end{array} $	a. 100 is 2 more than 98; about how many 100's in 76854 (700) $7 \times 2 = 14$ ($700 \times 2 = 1400$) Replacing the 7 groups of 2 because 100 is the divisor b. 8×100 (80×100) $8 \times 2 = 16$ ($80 \times 2 = 160$) c. 4×100 4×2 Remainder
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Many possibilities for developing greater insight into the fundamental operations are overlooked when patterns are not involved in a critical analysis of the algorithm.

Several years ago, a group of students began to question the writer about multiplication with eleven as a multiplier. Examples were structured and the students were asked to look for patterns that might guide them into setting up a new algorithm.

$ \begin{array}{r} 16 \\ 11 \\ \hline 16 \\ 16 \\ \hline 176 \end{array} $	1×1 ten $1 \text{ ten} \times 6$ <u>7 tens</u>	The multiplicand is 1 and 6, just as the partial products in the tens place. $1 + 6 = 7$. Write the 7 between 1 and 6 in 16 $\rightarrow 176$
--	--	--

The students arrived at the following generalization: In multiplication by 11, (a) find the sum of the two numbers in the multiplicand and (b) place this sum between the two numbers in the multiplicand.

Children were happy, excited, and eager to move forward with this approach to arithmetic. Two questions which they posed immediately were: "What if the two numbers in the multiplicand add to a 2-digit number?" and "Can we multiply a 3 or 4-digit number by 11?" These questions now became the basis for future assignments. What does happen if the sum of the two numbers is a 2-digit number?

$ \begin{array}{r} 57 \\ \times 11 \\ \hline 57 \\ 57 \\ \hline 627 \end{array} $	Note the importance of place-value. The 12 tens are regrouped to 2 tens and 1 group of one hundred.
---	---

One must be aware that many examples are solved the common way before generalizations are forthcoming. Place value is central to interpreting why these new ways work.

The second question was: "Can we multiply a 3- or 4-digit number by 11?" Where might one begin to develop this notion? In past experiences, children have found that the common algorithms are excellent in presenting patterns. For example,

$$\begin{array}{r} 432 \\ \times 11 \\ \hline 432 \\ 432 \\ \hline 4752 \end{array}$$

What patterns appear in the tens and hundreds places in the partial products? How does one get thousands?

$$(\text{tens} \times \text{hundreds} \rightarrow 10 \times 400)$$

Can the generalization stated earlier about multiplication by 11 be used?

$$\begin{aligned} 1 \times 2 &= 2 \\ 3 + 2 &= 5 \text{ (5 tens)} \\ 4 + 3 &= 7 \text{ (7 hundreds)} \\ 1 \times 4 &= 4 \text{ (10} \times 400) \end{aligned}$$

The product is 4752.

There is no one way to solve a problem. Generating interest, desire to participate and freedom to try out ideas are necessary to discovery. At the close of a period of verifying and evaluating the above generalizations, a student who seldom spoke said, "I believe I have still another way to solve multiplication by 11." His generalization was precise and summed up what the class had been saying and yet not completely identified. He said, "Multiply by 1 in the units place, add the number to the right because we multiply 10 and then add any carry number."

$$\begin{array}{r} 53768 \\ \times 11 \\ \hline 591448 \end{array}$$

- $1 \times 8 = 8$ (8 in the units place)
- $1 \times 6 = 6$, $6 + 8 = 14$. Write the 4 in the tens place, carry one hundred.
- $1 \times 7 = 7$, $7 + 6 = 13$, $13 + 1 = 14$. Write the 4 in the hundreds place, carry 1 thousand.
- $1 \times 3 = 3$, $3 + 7 = 10$, $10 + 1 = 11$. Write 1 in the thousands place, carry 1 ten-thousand.
- $1 \times 5 = 5$, $5 + 3 = 8$, $8 + 1 = 9$. Write the 9 in the ten-thousand place.
- $10 \times 50,000 = 500,000$

This is not all one can do with this pattern. What could children discover if they were faced with a multiplier of 12 or any of the teens? What if one were challenged to think through the answer for 13×15 ? Does the solution lend itself to simple mental calculation?

$$\begin{array}{r}
 15 \\
 \times 13 \\
 \hline
 15 \\
 30 \\
 50 \\
 100 \\
 \hline
 195
 \end{array}$$

$$\begin{array}{r}
 \text{Partial a.} \\
 \text{Products} \\
 \begin{array}{r}
 15 \\
 \times 13 \\
 \hline
 15 \\
 30 \\
 50 \\
 100 \\
 \hline
 195
 \end{array}
 \end{array}$$

b. What is the sum of the numbers in box a? in box b? In box a, the sum is really 180 because we multiply by the 10 in 13. Then, in box b, the sum is also 180. Add to this sum the product of 3×5 . The product of $13 \times 15 = 195$.

The product is the sum of a and b:

$$\begin{array}{r}
 18 \quad \text{a. } (18+4) \times 10 = 220 \\
 \times 14 \quad \text{b. } 4 \times 8 = 32 \\
 \hline
 252 \quad 32 + 220 = 252
 \end{array}$$

What can teachers do to stimulate children to think and to use the discovery approach? Here are several principles to follow:

1. Challenge children with the unusual. For instance, ask a pupil to show in as many ways as he can how to find the answer or show in three ways how one can find the answer.
2. Help the child to interpret the problem. Guide the child to find the elements given. Is a sum given? a factor? a dividend? What other ideas are present? Help the pupil by giving him time to think.
3. The teacher should know when to help a child. The pupil will more readily accept his responsibility for thinking if he knows he must not depend on the teacher to complete his work.
4. Asking questions that guide discovery is an art. The teacher, with patience and practice, will find sequential questions that set up a step-by-step process in thinking that will guide the child's discovery. One will ask such questions as: Can you set up the equation which explains the situation (example in the first paragraph)? What do we need to know? How did you discover that? Is there another way to find the answer? Can you prove your answer?

Discovery occurs when children see the relationships of the facts in a problem to known facts, when they are permitted to explore in a variety of ways for the solution and when they are encouraged to advance and to promote their own ideas.

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Social Studies: Processes of Inquiry

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Social studies objectives have always centered upon enabling students to function effectively as members of society. Today's young citizens must become informed and concerned about their social world; they must possess skills and intellectual power necessary to recognize social problems and strive to resolve them; they must build individual-group skills and understandings essential for living and working in harmony with others. Social studies holds a pre-eminent position for achieving these goals, for the focus of its content and study is *people*—their ways of living; their values, traditions, institutions.

The young today are orienting themselves to a social world characterized by unprecedented change and unrest. They will meet social problems, global in scope, which demand innovative, untried solutions. Confrontations with people from diverse cultural backgrounds will continue to present value dilemmas and conflicts, requiring conscious appraisal of beliefs and values. To enable students to cope with the problems of a complex social world, educators are readdressing themselves to the tasks of developing students' intellectual powers, of promoting openness to ideas and people, of building innovative, autonomous thinkers. They are placing increased emphasis upon discovery learning and the methods of inquiry as vehicles for accomplishing these tasks.

Inseparables in Inquiry-centered Classrooms

Inquiry engages students in the process of raising questions, formulating hypotheses, searching for and studying relevant ideas and materials, and structuring concepts and generalizations. An inquiry-centered classroom brings into sharp relief the close relationship between items sometimes viewed dichotomously: scholarly knowledge-inquiry; cognitive process-valuing. Scholarly knowledge is necessary for inquiry of depth and quality. Acquaintance with pertinent knowledge in the scholarly fields expands the range of ideas and protects pupils from inquiring into the inconsequential. Of course, the exploration of the inconsequential may sometimes provide the impetus for inquiry. Conversely, when students engage in inquiry and discovery learning, the search propels them toward relevant scholarly knowledge.

Human beings respond to their environments as thinking-feeling-acting beings. It is doubtful, therefore, that cognitive processes ever occur without valuing. When students inquire into the lives of other people, they cannot avoid studying value-based choices. In their own living and studying there are choices to be made and critically evaluated in terms of their consequences. Valuing demands choosing thoughtfully among alternatives and deliberately acting in accord with the choices. Teachers may make wiser instructional decisions if they think in terms of thinking-valuing processes.

Cues from the pupils

Some characteristic developments occurring among middle-school children support the achievement of social education aims.

Through forays into the community, through travel, television, radio, books and newspapers, children expand the boundaries of their social world. They search for accurate ideas and information about people from many authorities. Yet, there are wide variations among pupils in the experiences they have had and in the meanings they build from their experiencing. Some may have had limited contacts with certain groups, may not have explored the variations within groups or examined their own bases for grouping people. Each child will have some accurate information, some gaps in information and some misconceptions. School activities should be planned to compensate as far as possible for whatever limitations exist. Inquiries into the nature of a medium of mass communication interest students and, more importantly, make them more judicious in their use of the medium.

Middle-school children are growing into a stage when they are likely to explore the world through the eyes of another—usually, at first, an age-sex mate. Absorption in a close companionship, together with neighborhood social patterns, can lead to exclusion of other peer groups. While providing many opportunities for intimate peer-group interaction, the teacher can widen interaction patterns by structuring activities that bring pupils together in a common and absorbing enterprise.

Peer-group activities and expanding contacts in the social world challenge values internalized when "our" ways were the "right" ways. Now is a time when pupils need ample opportunities to examine and re-examine periodically their value-based choices in terms of personal-social consequences.

Rules and Processes for Community Action

Rules and fair play and group organization are matters of paramount concern. When they plan, live with and revise rules and organizations for their groups, children build understanding of ways in which people make and implement decisions affecting group welfare. Thus, they develop a cognitive structure that supports study of organizations within the community, the state, the United Nations.

Most exhibit great interest in process—how things are done, how things are known. They can use, in simplified form, the processes social scientists use to discover knowledge in their fields. For instance, they can use interview and questionnaire techniques to inquire into social conditions of their own and community groups. They can use social science concepts, such as values, roles, sanctions or power, leadership and decision making, to form hypotheses for inquiry into other cultures, provided they have built the concepts through study of their own culture.

Intellectually, the pupil has some grasp of the historical past; he is able to reason and hypothesize on what is possible and probable; he can perceive antecedent-consequent relations in human affairs. He can deal with abstractions and perceive relationships among them without recourse to the concrete. This does not mean he can operate on a highly abstract, philosophical plane. Rather, he can deal with abstractions relevant to matters in which he has built a firm conceptual base from direct, concrete experience.

The teacher can expect that some pupils will not have enough ideas with which to think in many social studies areas; most will encounter ideas they cannot understand. The teacher, then, must be prepared to provide sufficient direct, concrete experiences to build a cognitive structure that permits assimilation or accommodation of new ideas. The experiencing must include the processes of observing, differentiating, comparing, analyzing, grouping, regrouping.

Inquiry in a Depth Study

Social studies concepts and generalizations, as well as skills in seeking, discovering and organizing knowledge develop more sturdily if pupils explore in depth a few studies, characterized by several phases with much interplay among them:

- exploring a situation or statement, or raising a question which challenges existing ideas, beliefs, attitudes
- creating a big question or problem which has the power to promote a search
- studying and clarifying the problem
- developing hypotheses or lead questions which direct the search
- raising specific questions that focus the search
- developing a strategy for the search
- locating and studying data
- organizing and communicating what has been learned

If initial procedures are unhurried and allow for open exploration of several ideas and alternative proposals, teacher and pupils can determine when they have a problem which propels a search.

The problem, once identified, is probed to help pupils focus their vague ideas, to clarify definitions and to propose alternatives. From this exploration they formulate a few leading questions or hypotheses to direct the search. When they determine specific questions to answer in order to test the hypotheses, they decide how to proceed, what data to seek and where. At this point social science concepts and processes can be useful in structuring the search.

The heart of the search is making the materials talk. What ideas, questions, procedures will reveal the significance of the data? As data are examined and cross-examined, the pupil is confronted with questions of reliability, bias, sufficiency, which may force further search. How to record and report the data, what facts are important, what inferences can be justified, what generalizations supported must be determined. In the process, students learn how scarce are the data supporting some inferences, how tentative are conclusions in the social area.

Unless discussion is frequent and open, unless teachers act so as to assure open thinking and self-propelled attitudes, inquiry will be thwarted. Skill in using open questions and a firm belief in students' own potentials and desires for learning are requisite for success in discovery learning and the processes of inquiry.

Innovative Materials and Programs

Evolving in the social studies field are multiple instructional materials, "model" units and programs developed to promote thinking and involve students in processes of inquiry.

From commercial companies and professional organizations, teachers can procure primary sources: such as, collections of photographs; statistical data; reproductions of original documents; and early maps, letters and diaries.

Open-ended case studies, on film or in print, are designed to involve students in case study procedures for solving problems and making value-based choices. Simulations and games analogous to real-life situations focus upon concept development and decision making in such areas as economic life, legislative procedures and international affairs. Many use computerized feedback; most have rules which students must follow; some place high premium on winning. Teachers use these materials in a variety of ways. Some follow the directions accompanying the materials; some follow suggested procedures but make adaptations for their pupils; some use them, along with other activities, in a depth study.

"Models" for inquiry based upon a carefully formulated theoretical framework are being developed through Project Social Studies (National Defense Education Act). Materials, procedures, activities are selected, developed and sequenced to produce cognitive structure. Some focus upon the use of authentic, concrete data to develop concepts and generalizations; some utilize a specific mode of inquiry adapted from a social science; some strive to strengthen selected processes for solving problems.

Teachers, singly or in groups, will need to examine any innovative program, not only in terms of what it is designed to do, but in terms of what it does do when used with their students.

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Perspectives on Evaluation

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Some school superintendents blame colleges for turning out poor teachers. Colleges blame high schools for inferior products; high school teachers often assert that the junior high—and more recently the middle school—isn't teaching anything. Teachers here attribute failures to the elementary and primary schools, where again teachers say, "What can we do after the mess the homes have made?"

In one large high school, the teachers of ninth-grade mathematics asserted that their feeder schools were sending up pupils completely unprepared for ninth-grade mathematics. One year the results of an intelligence test and a mathematics test taken by all pupils in the eighth grade standardized on the same population indicated that while the pupils were a little below average on the intelligence test they were somewhat above average on the mathematics examination. Instead of being poorly prepared, the senior high school was receiving a group somewhat better prepared than they might reasonably have expected.

What is evaluation?

When we evaluate, that is, to try to find out how well we are doing what we set out to do, we gather information to find out (1) how well teacher and pupil goals are being achieved and (2) how we might modify our practices so that we may make better progress.

Evaluation should indicate not only outcomes but also the process by which the outcomes are sought. Sometimes stated purposes are so vague that either they give us little sense of direction or they only enable us to assert that what we are doing is the best way to achieve the goals.

"Preparation for citizenship" is probably an acceptable goal for schools on all levels in all societies. However, it does not tell us how our practices must be different if pupils are to be good citizens in a democratic society rather than sheeplike followers of a totalitarian regime. We would need to spell out certain terminal behaviors of the democratic citizen including voting, running for office, serving on juries, bearing arms, being informed on issues and candidates, and obeying laws.

Evaluation is concerned with teachers and the school itself as well as how well pupils are doing. In 1946 a study of public schools in Florida to find out whether they were providing equality of educational opportunity for children demonstrated glaring inequalities. The entire system was modified to set up a "minimum foundation program." The emergence of the middle school is the result of growing dissatisfaction with the 6-3-3 pattern and similar organizations. It is believed that a middle school can do certain things better for children than can the present junior high school organization.

Why evaluate the Middle School?

The junior high school was supposed to be a bridge from elementary school to high school, covering the turbulent period of adolescence.

Research of anthropologists has shown that the stresses and strains of adolescence are more cultural than biological. Margaret Mead, for example, found that adolescence is not a traumatic time for Samoan children. Our junior high schools have tended to compound stresses through fostering competitive athletics, social affairs emphasizing early dating, marching bands, and other activities usually associated with college and high school. At the same time medical and nutritional research indicate that adolescence occurs a year or two earlier than it did when the junior high school concept developed. Many people have felt that fifth- and sixth-grade children are more like seventh- and eighth-graders than they are like first- and second-graders and that they are ready for something different from the self-contained classroom that has characterized their first four or five years in school.

Before the majority of American school systems convert to the middle school it would be wise to test out the assertions for the middle school to find out whether it can do a better job than conventional upper elementary and junior high schools that cover the same years. Some of the many comparisons that can be made include the following:

As compared to pupils in conventionally organized schools, pupils in the middle school will:

- become more self-directed learners
- have fewer and less intense social and psychological problems
- equal or exceed pupils on standardized tests of academic achievement
- have more favorable attitudes toward school
- hold more adequate self-concepts.

Furthermore, measures of creativity among middle school pupils will show an increase rather than a decrease during middle school years. Comparisons can also profitably be made about teacher morale, teacher satisfaction, teacher turnover and teacher professional practices.

Such studies would require some expert help and would necessitate control schools, preferably schools in the same systems serving similar populations and covering the same grades in regular elementary and junior high schools.

Some additional reasons for evaluation in the middle school are:

1. To provide information on how well the purposes of the middle school are being achieved.

One system which has started a number of experimental middle schools has as two stated purposes (1) to achieve better ethnic distribution in the intermediate grades, and (2) to improve academic achievement in relation to the rate of academic growth normally found among educationally deprived children in grades 5 through 8.

Once agreement is reached on what constituted "better ethnic balance," a census of pupils and staff could give adequate comparative data. To test the purpose of improving academic growth among educationally deprived children would require a careful research design, collection of equivalent data over time, and somewhat sophisticated analysis of variance and possibly covariance to provide answers.

2. To provide feedback for improving practices in the middle school.

"Improving practices" means what teachers do, how they do it, and all the courses, activities, and services provided for children in the middle school. A newly organized middle school probably has more openness

and flexibility for change than an older, traditional organization, and it is extremely important that data from evaluation be used to confirm or serve as a basis for modifying practices.

3. To provide psychological security to staff, pupils, parents and school officials.

Teachers need to know whether they are succeeding with their pupils. Pupils will usually do better if they have clear evidence of success. A group of remedial arithmetic pupils showed no change in speed or accuracy on number facts when they just practiced every day. When they had clear goals of accuracy and speed whose achievement meant no more regular drill, they speedily achieved these goals.

What is evaluated?

All schools should have a clear statement of goals and of a philosophy supporting the goals. School faculties also need to have a clear idea of the characteristics of the communities and pupil population they serve. Only in terms of both can judgments be made about the appropriateness and effectiveness of the school program for meeting the needs of pupils.

Goals themselves should be examined: for feasibility; for consistency with what is presently known about how pupils learn; for consistency with each other; for including areas judged to be important functions of schools; for appropriateness for the pupil population and community served; for being trivial; and for consistency with the democratic tradition.

The school curriculum should be periodically surveyed for its appropriateness in terms of the school objectives and characteristics of the pupils. Such a survey should include all courses, activities and services offered; the nature of offerings, physical facilities, qualifications of the instructional staff, instructional materials and activities and methods of evaluation; guidance services, activity program and health services.

Evaluation is all too often limited to samples of relatively low-level cognitive skills, the pupil's recall of who, what, when, and where. Educational outcomes have been classified in two monographs with a third in preparation (2), (5). Cognitive objectives include knowledge, comprehension, application, analysis, synthesis, and evaluation. Affective objectives include appreciating and valuing. Psychomotor objectives would include attainment of skills of musical, artistic, athletic and vocational production.

How evaluate?

Evaluation in the middle school, just like evaluation in any other level, implies the use of a variety of methods of gathering data from which to make judgments and modify practices. Too often only teacher-made tests of limited cognitive skills are used or commercial, standardized tests are used improperly.

In using commercial evaluation tests, cautions should be exercised in making sure that pupils have had an opportunity to learn that for which they are being tested. Ability level of person or group must be considered. Socioeconomic backgrounds of pupils influence motivation and test performance. Another factor neglected in interpreting results is regression effect. Individuals or classes considerably above or below the average for their age on intelligence tests will probably perform closer to the mean on academic tests. This does not reflect either unusually

good or unusually poor teaching; it is just how things are. It is good to remember, also, that an individual score is subject to considerable error because tests are never perfectly reliable.

But radical drop in test performances should not necessarily be interpreted as just the result of test unreliability. Unusual test results should be viewed seriously by the teacher as reasons for formulating and testing hypotheses, which might explain changes. Medical referral is sometimes indicated.

Commercial and teacher-made tests are just one way of gathering data. There are many other ways. A teacher wanting to know whether pupils write better as a result of using transformational grammar in sixth and seventh grades might have pupils write stories or short articles at the beginning of a study and again at the end. The writings are coded and graded "blind" by two or more knowledgeable teachers. The before and after writing samples are mixed, identified only by number, and sorted into piles—top fourth, middle half, and bottom fourth. A higher proportion of samples after completion found in the top fourth and a smaller proportion in the bottom fourth is evidence that writing is improving.

The ingenious teacher will think of many other ways of data gathering. Some of these might be unsolicited comments from parents, reports of observers, anecdotal records of student behavior, children's voluntary use of library books, how children use "free" time. Toward the end of the year, one second-grade teacher wrote on the board, "This morning do whatever you feel you most need to do." She confessed that this was a calculated risk. But every child seemed to an observer to be using his time constructively. Some read, some practiced arithmetic skills, some did art work, a few came to the teacher with questions on what they were doing, and some went to the school library.

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New Concepts of Learning: Future Directions

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No area of science has changed as dramatically in the last twenty years as the field of cybernetics. Webster's dictionary defines cybernetics as a science dealing with the comparative study of complex electronic calculating machines and the human nervous system in an attempt to explain the nature of the brain. From this field have come the wonders and dangers of automation, the vast potentialities of the computer and great contributions to space science. The major contributors to the first cybernetics were Norbert Wiener, Arturo Rosenblueth and Warren McCullough, who pioneered a science of automatic control in machines and in animals based on feedback. While the first cybernetics is based upon scientific and mathematical principles, the second cybernetics is based upon humanistic endeavors concerned with growth, development and the rise of complex structures within a society. The mathematics of the first cybernetics is well developed, but the mathematics of the second is only at its beginning stage. Application of the second cybernetics has not even started in most fields and is gradually reaching psychology and sociology in multivariate analysis research. Further development belongs to the coming generation—to the school children of today (Muruyama 1964).

Defining Reading

Holmes and Singer (1961) in their Substrata-Factor theory defined reading as being an audio-visual processing skill of symbolic reasoning. They analyzed the intercorrelations of 56 test variables for a total group of 400 students comprised of boys, girls, fast readers, slow readers, powerful readers, nonpowerful readers, verbally bright students and verbally dull students in high school. Their conclusions as to the subabilities which account for success in reading power for each group were subdivided into a hierarchy of primary, secondary and tertiary sets. The *primary* set of eight substrata factors which contributed to the power of reading variance were: auding ability; vocabulary in isolation; vocabulary in context; verbal analogies; visual verbal meaning; tone intensity; mechanical interest; and study planning and deliberation. The *secondary* subsets contained musical taste, musicality, tonal movement, figure and ground, spatial relations, range of information, word sense, reasoning, prefixes, Latin and Greek roots, computational interest, literary interest, and clerical interest as well as school adjustment and morale. The variables found in the subsets at the *tertiary* level were tone quality, pitch, tonal memory, rhythm phonetic association, homonyms, mechanical aptitude, suffixes, spelling, word fluency and age. The results of the above analysis for the subabilities that underlie power of reading in the total sample were interpreted to be in basic agreement with the Substrata-Factor Theory.

To explain further, reading skill is sustained by the interfacilitation of an intricate hierarchy of substrata factors that have been mobilized

as a psychological working system and pressed into service in accordance with the purposes of the reader. Different people may perform the same task with equal success by drawing upon different subsets of abilities. Crucial abilities include visual—verbal meaning, listening, homonymic meaning, literary interest and inductive reasoning. For example, listening depends upon such subfactors as vocabulary in context, range of information prefixes, verbal analogies, and Latin and Greek roots. Range of information can be partially accounted for through vocabulary in isolation, chronological age and suffixes (Holmes and Singer, 1961). The critiques of this research strongly criticize the use of the word "theory" so loosely, but admit this is an attempt to measure through multivariate analysis research a complex process combining mathematical, psychometric and neurological processes (Sparks and Mitzel, 1966) (Raygor, 1966).

The future of multimedia can only be conjecture, but several theorists have predicted or suggested inevitable change as a result of immediate access to the present environment. Deese (1967) has suggested different levels of conceptualization in structure which explain the changes in the way people think about and use words, or the psychological structures responsible for free associations of words and in learning. The three cognitive operations in conceptualization he describes are grouping, the invention of antonymic features (antonyms) and categorizing.

Concept Changes

Changes in concept are attributable to three aspects of the meanings of words (a) the concept itself; (b) the phonemic and/or graphemic representation assigned to that concept; and (c) the nature of events, relations or objects signified by the concept. Languages differ as to the construction of concepts, but every language permits the encoding of concepts no matter how awkward the terminology. Concepts change in two related, distinct ways—content and structure. The structure of a concept sets certain essential limits on the content it may express, because it is the form that the representation of a concept takes.

A basic human cognitive activity is seeing resemblances among concepts or grouping those concepts by some partial and generally unspecified identities. The grouping operation itself is expressed in judgment of resemblance, in the production of similes, metaphors and analogies. The differentiation of a concept is never logically adequate to completely specify a concept so that it is possible to differentiate it from all other possible concepts. The important thing about linguistically utilitarian language is what is left unsaid. Most changes in meaning result from an application of grouping, the invention of antonymic features and categorizing. They are independent, so that different aspects of change of meaning may depend upon different operations. A change in perceived grouping, for example, may be justified by the invention of a feature that, in truth, is unrelated to the grouping. The obvious result is logical inconsistency, a result often ignored by ordinary people. Perhaps the most common examples mentioned by Deese (1967) are the changes in the meanings of the word *cool* and *compact* since the late 1950's. *Cool* until that time had a certain frame of reference for all people within the context of a sentence; but today, because of the generation gap, will have different meanings dependent upon age. *Tough* and *cool* have the same connotation for adolescents describing a pretty girl and *compact* to the

same group describes a cheap small car, but to the adults teaching them has a different meaning. Another example would be the various meanings of the word *square*.

Factors of Place and Form

Other cognitive operations important in changes of the meanings of words besides content and structure are scaling and location. Scaling is represented by various grammatical and vocabulary aspects of the language. Examples include the comparative and superlative forms for adjectives and a series of words, such as tiny, slight, little, small, big, large, great, grand, vast and huge. When certain features or attributes of a word or a series of words are scaled, the linguistic or language use determines the meaning.

Location of concepts within spatial maps and models can be explicit and/or implicit when revealed in patterns of use. Examples of explicit spatial models are broad, distant, narrow, etc., because those words are derived principally from visual imagery. Examples of implicit spatial models would be fastener, trap, positive, negative, etc., because the context determines the meaning or meanings. Seldom is a new word learned by forming hypotheses about how it should be used. Rather, it is acquired most often from example and context. One seldom stops to determine whether an interpretation of communication received from another person is correct, but the reply reveals the level of understanding. Change in usage arises among many people simultaneously, because new meanings are derived when conditions are favorable for inventions in conception. Mass media language is apt to undergo many changes, but communication is facilitated by the common access to these changes by many people. Simply stated, language is a product of the culture. (Deese, 1967)

Communication—Beyond the Confines of Language

McLuhan (1967) firmly avows that watching television is a tactile rather than visual experience; that man goes through life looking through the rear-view mirror, aware of his environment only after he has left it, and that what is communicated doesn't count as much as how it is communicated. His basic premise is that there have been three ages of man—the Preliterate or Tribal, the Gutenberg or Individual, and the present Electric or Retribalized. Each age is shaped by the form of information available. And by information McLuhan means not only the standard media such as print and TV, but also clothes, clocks, money and any artifact that conveys meaning.

"In the pre-alphabet age the ear was dominant. Beginning with the Greeks, the new medium of the phonetic alphabet centered on the visual. Gutenberg's invention of movable type forced man to comprehend in a linear, uniform, connected, continuous fashion. Individualism was born and it became possible to separate thought from action. In the nineteenth century man entered the electric age with the invention of a new medium, the telegraph. The old linear visual connections were severed and the aural and tactile senses emerged once again. With Telstar and other high-speed communications annihilating space and time, an all-at-once environment has taken shape. The key word in the new Electric Age is involvement. The old print medium involves one sense (the visual) while the new electric media, particularly television, involve all the senses simultaneously." (Newsweek, March 6, 1967, pp. 53-57).

"It is a matter of the greatest urgency that our Educational Institutions realize that we now have civil war among these environments created by media other than the printed word. The classroom is now in a vital struggle for survival with the immensely persuasive "outside" world created by new information media. Education must shift from instruction, from imposing of stencils, to discover—to probing and exploration and to the language of forms."

"The young today reject goals. They want roles R-O-L-E-S. That is, total involvement. They do not want fragmented, specialized goals or jobs." (McLuhan, 1967, p. 100).

In his writings McLuhan emphasizes the importance of education to help man evaluate, reject, explore, and revise the media. With all of the new developments in media there will be many changes in man's behavior, but he will learn to control his environment through a new social awareness. The strategy for social action is not nearly so apparent as his enumerating the inevitability of change.

The ideas, theories, materials, machines and questions presented only reinforce the amount of change available. Since the human mind will integrate or ignore what is printed here, the individual and the society will determine the utilization.

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